Incorporative Frontiers of Formative Mesoamerica: Archaeology and Identity at Rancho Búfalo, Chiapas, Mexico

INCORPORATIVE FRONTIERS OF FORMATIVE MESOAMERICA: ARCHAEOLOGY AND IDENTITY AT RANCHO BÚFALO, CHIAPAS, MEXICO

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ABSTRACT

This dissertation explores the key role of identity in the emergence of social complexity. The superordinate identity categories that linked previously disparate social communities are defined herein as "world civilizations," and the material culture of the Mesoamerican example is studied through the interpretive lens of "poetics." The dissertation outlines surprising material heterogeneity within the Preclassic (1000 BC - AD 250) Maya and Olmec heartlands and demonstrates that the region can be better understood as a series of localized interpretations of an emergent Mesoamerican "world civilization." This offers theoretical and cultural context for data from Rancho Búfalo, Chiapas, Mexico, an archaeological site located in the Usumacinta River valley, which has been proposed as a possible Preclassic frontier between Olmec and Maya peoples. Varied data on architecture, ceramics, obsidian, and ritual deposits are compared with other sites and regions to seek affinities with Rancho Búfalo. Special attention is paid to cases where more than one region's material traditions are found to be expressed within a particular material category.

The data presented on Rancho Búfalo are the result of four seasons of fieldwork in and around the site as well as the laboratory analysis of artifacts recovered from these excavations. The five-hectare site core contained a diverse set of low-mounded masonry and earthen structures, including a single pyramid and a ballcourt. These data offer a contribution to archaeology of the Mesoamerican Preclassic and can be used to study early cultural formations in this region. By contextualizing these findings through a reassessment of Formative Mesoamerica more broadly, this dissertation argues that the emergence of complex society is predicated on diverse communities integrating a superordinate identity category that cross-cuts traditional divisions. This bottom-up model contrasts with top-down approaches to early complexity that emphasize conflict, monopolization of resources, or elite exploitation.

The results demonstrate that Rancho Búfalo, far from fitting neatly into a single regional category, drew upon material traditions from a broad range of centers and regions. The site plan was a local Usumacinta interpretation of broader Southern Mesoamerican architectural traditions. The ceramic slips most resembled the Northern Lowlands, and ceramic iconography evoked both the Southern Lowlands and Gulf Coast Region. The obsidian networks they used and their burial traditions most resembled the Southern Lowlands, however, the figurine traditions strongly evoke the Northern Lowlands. While this suggests Rancho Búfalo was a "frontier" site, the unexpected heterogeneity in Formative period sites across these essentialized regions suggest that current systems of classification are insufficient. This diversity can be understood most readily through an alternative model where sites responded in a localized manner to emergent Mesoamerican culture currents, both in the Rancho Búfalo case and in Southern Mesoamerica more broadly. This multiscalar approach can be usefully applied to a variety of archaeological contexts, including incorporative frontiers of emergent social complexity worldwide.

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CHAPTER 1 - INTRODUCTION

In this dissertation, I argue that the emergence of complex society is predicated on the integration of communities under the umbrella of a superordinate identity category, defined here as “civilization”. This bottom-up model contrasts with top-down approaches to early complexity that emphasize conflict, monopolization of resources, or elite exploitation. To explore this topic, I performed four seasons of fieldwork in and around Rancho Búfalo, Chiapas, Mexico as well as the laboratory analysis of ceramic, obsidian, and other artifacts recovered from the excavations. The theoretical and empirical components of this dissertation contribute to the archaeology of Mesoamerica and can be used to study early cultural formations in this region. By contextualizing these data through a reassessment of Formative Mesoamerica (1000 BC – AD 250) more broadly, I hope to inspire a conversation on the role of social identity in nascent complex societies.

Revised approaches to ethnicity, following Fredrik Barth (1969), and borderlands following Gloria Anzaldúa (1987), have demonstrated that substantial variance exists within supposedly essentialized cultural entities. My research was calibrated to incorporate these perspectives and to build upon work performed under the paradigm of the "mother culture-sister culture debate" that has guided most Preclassic Mesoamerican field investigations over the past half century. The "mother-sister" debate is culture historical and seeks to establish the relative cultural primacy of groups such as the Olmec, Maya, and Zapotec. This approach to the emergence of Mesoamerican social complexity relies upon problematic social categories defined in the mid-20th century. It tends to project Mayan and Mixe-Zoquean ethnolinguistic groups back in time as "Olmec" and "Maya" archaeological cultures, based on an implicit assumption that language, culture, and people exist as well-partitioned entities over thousands of years.

Despite efforts to move discussions of Mesoamerican social complexity beyond the "mother-sister culture debate" (e.g. Blanton, et al. 1996; Clark and Blake 1994; Lesure 2004), scholars frequently design research to seek superlatively early metrics of social complexity within major centers of traditionally defined cultural heartlands. My work at Rancho Búfalo built upon a broader range of anthropologically oriented scholarship on emergent social complexity from Mesoamerica and other world regions. While I contextualized my findings at the site with data collected from Preclassic Mesoamerica, I analyzed it through a global lens. In particular I explore the possibility of a Mesoamerican "world civilization" that served as a precondition for the emergence of complex society. This identity grouping operated in an ethnic-like mode alongside the nested and multivalent social categories that define communities. This approach offers a means to interpret heterogeneity on incorporative frontiers of emergent complex societies worldwide, including at sites like Rancho Búfalo.

1.1 Site and Study Region

Rancho Búfalo was discovered in 2010 during the course of regional reconnaissance of a 300 square kilometer region by the Proyecto Arqueológico Busiljá– Chocoljá (PABC) through permission granted by Mexico's Instituto Nacional de Antropología e Historia (Figure 1.1) (Golden and Scherer 2010). Based on surface features and ceramics, the site was field dated to the Preclassic[1] period. Unusually for the region, it was largely abandoned by the Classic period (AD 250 – 900), presenting a rare opportunity to study the Preclassic of the Middle Usumacinta River corridor without digging through later occupations. I joined PABC in 2011 and was able to participate in the first season of excavations and total station mapping at the site. The site's position on a hypothetical "western frontier" of the Preclassic Maya world dovetailed with my growing theoretical interests in social incorporation and ethnic borderlands.

[1] There is a generalized convention where "Preclassic" is used more commonly in the Maya area, while "Formative" is used in other parts of Mesoamerica. The periodizations, however, are coeval. They should be understood as synonymous in the context of this dissertation.

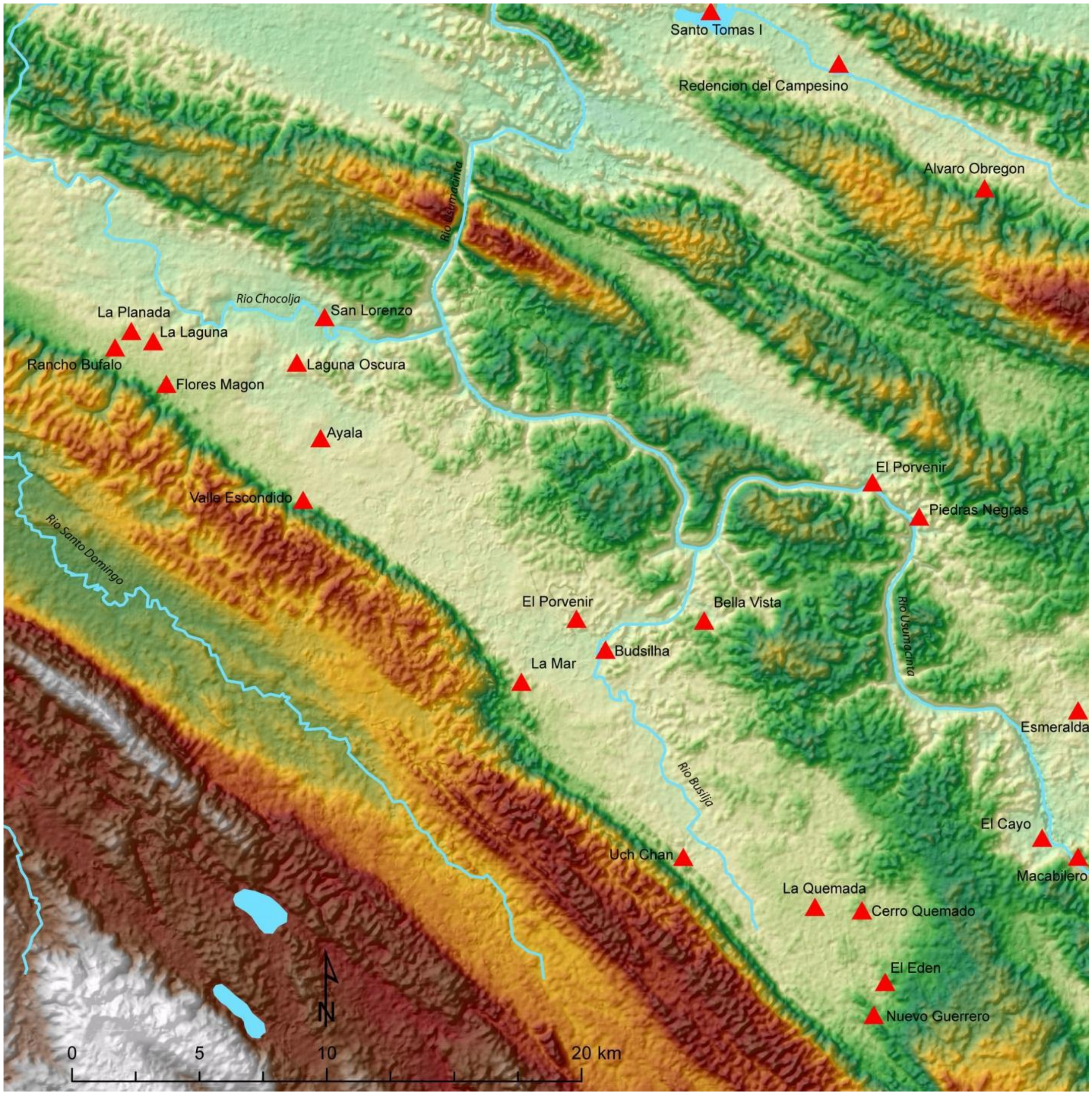


Figure 1.1 Middle Usumacinta River Valley map, showing Rancho Búfalo location and PABC region (J. Dobereiner)

The Usumacinta is the largest river system in Mexico and acted both as a trade conduit and a boundary in ancient times (Gunn and Folan 2000:238). In culture historical treatments, this region has been described as the frontier between the Preclassic “Olmec” and “Maya” peoples (Andrews 1990; Bravo 2013:14-16; Ekholm-Miller 1973; Lowe 1991; Rands 2007). This frontier perspective is in part driven by scholars projecting Classic-period phenomena back in time onto the Preclassic period. During the Classic period, The Usumacinta River region was an active frontier and contested space between Maya kingdoms (Aliphat 1994; Anaya Hernández, et al. 2003; Golden, et al. 2008; Stuardo 2007). The rich epigraphic record from primary centers like Palenque, Pomona, Piedras Negras and Yaxchilán and secondary centers like La Mar and Bonampak demonstrate that it was a conflict heavy part of the Maya world, with abundant evidence for competition between centers (Golden and Scherer 2006; Golden, et al. 2005; Kingsley, et al. 2012; Martin and Grube 2008:146). Archaeology bolsters these epigraphic data, and demonstrates that primary centers imposed unique architectural and burial traditions upon their subordinate centers (Golden and Scherer 2013; Scherer and Golden 2009).

My dissertation both depends upon and expands this corpus of scholarship by allowing a longue durée assessment of change and continuity within a unique "Usumacinta" suite of material culture (Golden 2013; Golden, et al. 2008; Scherer and Golden 2009). However, I do not believe the geographic factors that made this region a political borderland during its Classic period history functioned in the same way during the Preclassic.

Rancho Búfalo itself is located between Piedras Negras and Palenque, less than 15 km from the Usumacinta River, which demarcates the modern Guatemalan-Mexican border. Highway 307 is directly to the south of the site. The five-hectare site core contains a diverse set of public structures, none of which exceeded four meters in height at the time of abandonment. This includes an earthen mound with multiple construction phases, a single pyramid, and a ballcourt. The site does not possess an E-Group. Shallow streams bound the ceremonial core of the site on three sides; a large, slow-moving body of water may have been a forth stream bounding the site on the south, before being diverted by the construction of Highway 307 in the 1990s. The site is located on a pair of modern cattle ranches (Rancho Búfalo, from which the site takes its name, and Rancho El Paraíso), and is typically dotted with several dozen mammals of the genus *Bos* (Figure 1.2).

Figure 1.2 Rancho Búfalo site photo (J. Dobereiner)

1.2 Objectives

Research at Rancho Búfalo was designed with related anthropological and culture historical objectives. The anthropological objective was to explore the emergence of social complexity through the lens of identity. I asked: did a superordinate identity category that crossed traditional ethnic, cultural, and political boundaries facilitate the emergence of social complexity? If so, I expected substantial heterogeneity in material usage at the site, and diversity between Mesoamerican centers that had been previously grouped together as culturally related.

Accomplishing this anthropological goal required me to engage in a culture historical goal as well: to demonstrate that the cultural categories of “Maya” and “Olmec” were not meaningfully separate by the Middle Preclassic period, and instead can be understood as a blurred continuum of local responses to the emergence of Mesoamerican complex society.

The anthropological framework explored through this research depends on a critical analysis and deconstruction of borderland processes and well-defined ethnic frontiers. I build on fundamental work on segmentation by E. E. Evans-Pritchard (1940), and explore these segmented identities as ethnic-like, following Sian Jones (1997). To explore the performative aspects of material culture and how it was used in multi-ethnic communities to signal identities to diverse audiences, I employed a material interpretation of “poetics,” following Roman Jakobson (1960) and Michael Herzfeld (1989). The result is a multiscalar approach to *ethnos* that can be usefully applied to past contexts, in particular incorporative frontiers where “world civilizations” are beginning to act in the same manner as other identity categories, and enable integration of emergent complex societies.

Key to this process is an approach to emergent Mesoamerican complexity that reaches beyond Rancho Búfalo itself. I drew upon a range of data from throughout Southern Mesoamerica, in particular the Southern Maya Lowlands, the Grijalva River Valley, and the Gulf Coast region, to deconstruct the standard ethnic groupings which are typically sought during the Preclassic. These roots of these groupings—in particular Maya and Olmec—can be traced to conferences and research from the mid-20th century, as explored in Chapter 3. A tremendous amount has been learned since these groups were first defined, including the discovery of dozens of additional sites, the advent of carbon dating, and thousands of field and laboratory investigations, yet, we are still relying on this nomenclature. Additional scrutiny of this data demonstrates that dynamic local responses, not conformance with these hypothesized cultural groups, more accurately characterize the spread of the Mesoamerican "world civilization."

1.3 Methods

I laid out above a mechanism for the interpretation of cultural frontiers and boundaries, using all of Preclassic Southern Mesoamerica as a source of data. However, given its unique position in the poorly understood Middle Usumacinta Region, Rancho Búfalo served specific ends in my study of Mesoamerican emergent complexity. Studying Preclassic cultural processes in and around Rancho Búfalo—a site between the putative limits of "Olmec" and "Maya" ethnicity in the Preclassic—served as a foil to demonstrate the lack of a firm boundary between these groups. My research at Rancho Búfalo thus necessitated a wide range of data that could be compared with other sites in the traditionally defined Maya and Olmec region, and beyond. These classes of data were compared with sites across sub-regions of Mesoamerica, revealing that in most cases Rancho Búfalo's use of material culture simultaneously evoked more than one region or culture.

A digital elevation model of the site was made by shooting topo points with a total station, which were then analyzed in ArcGIS 10.1 to produce a site plan (Figure 1.3). Regional reconnaissance to collect data on regional settlement, led to the discovery and mapping of additional architectural clusters less than one kilometer away including the Hearthstones, El Vecino, and Rancho Santa Cruz groups.

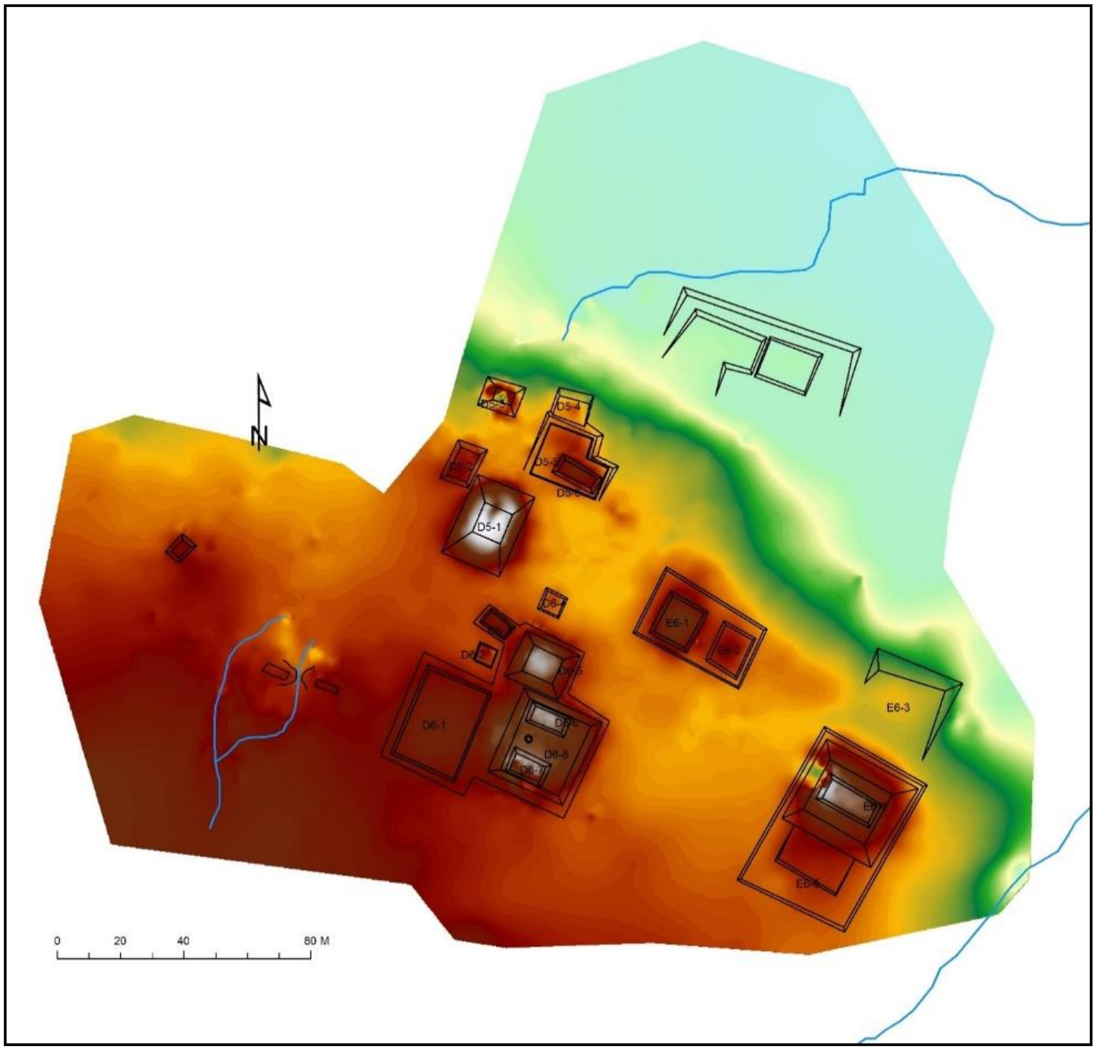


Figure 1.3 Structures, Water Features and Topography of Rancho Búfalo, Chiapas, México, 2013 (J. Dobereiner, B. Davenport, C. Golden)

Data on architectural methods was collected by investigating and drawing the profiles of structures damaged by looting, including D6-8, D5-3, and E6-4. Further architectural data was gained through excavations in and around the basal wall of platform D6-5, and a small platform wall found between structure E6-1 and E6-2. The chronology of the constructions was determined by excavating test pits directly abutting the majority of the site's structures. Plaza and horizontal excavations were also performed. A total of 67 square meters of excavations took place with the goal of reaching bedrock, and an additional 31 square meters of horizontal excavations were opened to explore final (Classic Period) reoccupation phases. These numbers do not include consolidation of looting damage.

Data on ceramics was collected through comprehensive laboratory analysis at the Universidad Autónoma de Yucatán of all 32,523 sherds recovered in the process of excavations at Rancho Búfalo. Preclassic materials were subjected to a novel modal analysis developed by myself and Dra. Socorro Jeménez Álvarez that emphasized surface treatments. Diagnostic pieces were photographed and drawn, and additional modal data on rim diameters and vessel heights collected by measurement with calipers. Four intact vessels were found in the course of investigation of the site.

Data on obsidian exchange and distribution was collected by a comprehensive chemical provenance analysis of all 1012 pieces excavated from the site. Of these, 1007 were successfully fingerprinted to source quarries. All were also subjected to typological analysis, and categorized as finished products (blades, reworked blades, flakes, or other tool types) or production debris (depleted cores, macroblades, production flakes, and other debitage). They were also weighed and measured.

Data on ritual deposits was collected by the excavation and documentation of four separate burials at the site. A greenstone cache was also found by the site's landowner in advance of the archaeological project's arrival. While it was not recovered professionally, its contents were studied, and information on its original location was provided to PABC by the site owner.

1.4 Chapter Summaries

Chapter 2 is a full outline of the theoretical contribution of this dissertation. It lays out a new framework for the emergence of complex society that emphasizes identity over traditional "prime movers" like population pressure, control of irrigation, or domination of food surpluses. By defining civilization an ethnic-like identity category that accompanies the emergence of social complexity, I argue in this chapter that it is possible to understand its spread as the adoption of a superordinate sense-of-self by a range of cultures and people, who interpret it in their own unique ways. To interpret the material culture that accompanies the spread of emergent complexity, I outline the utility of "poetics" as an interpretive lens that emphasizes the audiences that may have been sent or received signals through the use of a given object or style.

Chapter 3 explores the traditional arguments used to circumscribe the groups of "Maya" and "Olmec" during the Preclassic period. By outlining architectural and iconographic practices between regions, it demonstrates that the supposed lines between these two entities are often blurred. Specifically, within-culture comparisons between sites often demonstrate less similarity than cross-culture comparisons, raising questions about the utility of these long-standing categories.

Chapter 4 outlines the results of studies on Rancho Búfalo's site plan and architectural techniques. During the Middle Preclassic, the site already used a local orientation (30 degrees east-of-north) that was maintained throughout the history of the site and the Usumacinta region. Rancho Búfalo was also locally unique in the fact that its residents never built an E-Group, a common solistically aligned structure known to have been present in most early sites in the Olmec and Maya regions. In other ways, Rancho Búfalo resembled other early centers, including a resonance between its site plan and that of La Venta, Tabasco—though at a far smaller scale. During the Late Preclassic, the site operated as one of many small centers in the Usumacinta region, in which each possessed one of the ritual structures that comprise larger "full service centers" in other parts of Southern Mesoamerica.

Chapter 5 is an exploration of Rancho Búfalo's ceramics. The site's ceramics match generally with nearby Southern Lowland typologies from Ceibal and Uaxactún, Guatemala. However, in surface treatment and slips, the site possesses an unusual affinity with Northern Lowlands centers such as Komchen, Yucatán. The site possessed few sherds with iconography. That which is present evokes Gulf Coast imagery, including crossed-band motifs, double line breaks, and an early grapheme that is similar to the sign wʉ from the Isthmian syllabary.

Chapter 6 explores exchange and special deposits at Rancho Búfalo. The chapter approaches them as related aspects in a broader range of ritual behaviors. Obsidian was abundant at the site, and based on provenance data, appears to have been acquired from the same trade networks that were used in the Southern Maya Lowlands more broadly. The site's greenstone deposit, on the other hand, was placed near the northern ceremonial precinct, mirroring what was typically found at La Venta. Bodily practices at the site resonate with data from both the Northern Maya Lowlands and Southern Maya Lowlands. The burials themselves resemble extended burials with simple offerings known from nearby Preclassic centers like Piedras Negras, Guatemala and El Lacandon, Chiapas. However, Rancho Búfalo had no figurines at all - an unusual pattern for Preclassic Southern Mesoamerica, on that had previously been documented only at Northern Lowland centers such as Komchen.

Chapter 7 explores these datasets holistically, in an effort to situate negotiation and action at Rancho Búfalo in time and space. The diverse influences at the site across varied media are made salient through an application of the theoretical framework laid out in Chapter 2. An analysis of these data, alongside the broader heterogeneity in Preclassic centers across Southern Mesoamerica, demonstrates the insufficiency of the labels of "Maya" and "Olmec" and the mother-sister paradigm. The data fit better with a model where emergent complexity is accompanied by a loosely incorporative identity category (civilization) which populations at early Mesoamerican centers chose to interpret in diverse ways.

CHAPTER 2 – CIVILIZATION AS IDENTITY: NEW THEORETICAL APPROACHES TO FORMATIVE COMPLEX SOCIETIES

Traditional explanations for the emergence of complex society have focused on population pressure and top-down social incorporation without sufficiently emphasizing the role of social identities in this process (Carneiro 1970; Rathje 1971; Wittfogel 1981). Dominant hypotheses tend to emphasize a precocious elite that imposed its will on subjects through functional or ideological means: control of irrigation (Adams 1974; Wittfogel 1981), organizing exchange and production (Brumfiel and Earle 1987; Cobb 1996; Kipp and Schortman 1989; Rathje 1971; Webb 1974), strategically accruing food resources for deployment in times of crisis or competitive generosity (Clark and Blake 1994; Dietler and Hayden 2001; Hayden 1996; Kuijt 2009; Smith 2015b), or monopolization of social and religious knowledge and performance (Demarest 1992; Rice 2008; Wheatley 1969). These models offer limited consideration of other social classes or diversity beyond these groups' susceptibility to elite inducement. They also tend to privilege large sites within precocious "core" societies, and ascribe limited agency to their so-called periphery.

A full understanding of how diverse peoples became integrated into social collectives requires a broadened dataset that extends beyond the decisions of privileged individuals in major centers. These cross-group "collective actions" are increasingly understood as central to the emergence and maintenance of pre-modern states, and can be usefully applied to early phases of complex society (Blanton and Fargher 2008; Canuto and Fash 2003; Carballo, et al. 2012; Golden and Scherer 2013). Building on this integrative perspective, I have approached the emergence of Mesoamerican complex society as depending on a new, overarching sense of membership that unified disparate social groups into a system of mutual cultural intelligibility and shared values. This new type of social grouping (defined below as civilization), can be explored as a meta-category that worked in concert with already extant identity groups, not in lieu of them. From this perspective, civilization represented the largest-yet scale for a type of collaborative identity grouping that had already occurred in the development of chiefdoms, towns, and other segmented community structures.

This type of new overarching identity has been documented in cases such as the founding of Cahokia in late first millennium North America. Timothy Pauketat posits that a new institution was formed by the physical production of earthen platforms: "The mound builders probably came from many different backgrounds, with at least as many different understandings of what earthen construction meant. So the mounds were not simply *reflections* of political institutions as they were. Mounds and mound building were institutions *comings into being*" (2007:42). The varied origins for the basketloads of soil that can be seen in these architectural profiles demonstrate the wide range of source communities who joined this new, collaborative enterprise (Pauketat 2007). Yet, regardless of the mechanism by which it became possible to instantiate newly unified ethnic, religious, and sociopolitical beliefs across a broad population, where did the preceding identities of these diverse peoples go? A comprehensive approach to nascent complex societies must account for the heterogeneity of constituent groups beyond presupposing the disappearance of their membership's variation.

The framework I have developed for studying nascent complexity through identity accounts for this multiscalarity by applying theories of segmentation and ethnicity developed by social scientists. This chapter outlines my framework across three sections. First, I explain how these new incorporative entities can be usefully understood by applying the lens of ethnogenesis explored by Benedict Anderson's *Imagined Communities* (1983) and Gayarti Spivak's strategic essentialism (1987) and expanded upon by anthropologists such as Sian Jones (1997), and Jean and John Comaroff (1987, 2009). Second, I explain how segmentation, in the sense developed by E. E. Evans-Pritchard (1940), can be used to organize and describe the various scales of social identity inherent to, and whose collaboration enabled the emergence of, social complexity. I illustrate these first two sections with a case study from Early Bronze Age Mesopotamia, where recent scholarship has moved beyond individual cities to employ an increasingly regional perspective.

Finally, to explore these longue-durée incorporations archaeologically, I outline a framework for the study of material remains from incorporative frontiers and how the objects chosen by these peoples were designed to speak to multiple audiences. I interpret the material culture of early integrative peoples through the lens of "poetics," in the semiotic sense developed by Roman Jakobson (1960) and refined by Michael Silverstein (1976) and Michael Herzfeld (1985, 2005). This linguistic anthropological approach makes it possible to understand how extant social groups negotiated the inherent tension between their standing social identities and the new incorporative entities that accompanied emergent social complexity. Collectively, these methods allow me to seek negotiation and expression of identity within individual communities outside of traditional "core" centers, and interpret the processes that facilitated the emergence of overarching complex societies, offering a framework for the study of Rancho Búfalo and its position in the emergence of Mesoamerican civilization.

2.1 Outlining Ethnic Identities

My definition of civilization, and exploration of its relationship to emergent social complexity, emerges from Norman Yoffee's treatment of civilization as: "the larger social order and set of shared values in which states are culturally embedded…the symbols (both literary and material) that signify this common identity will be maintained, reproduced, and altered in concert" (2005:17). I extend this approach to suggest that nascent civilizations had analogous in-group/out-group mentalities and shared value systems to ethnic identities as defined by Sian Jones: "any groups of people who set themselves apart and/or are set apart by others with whom they interact or co-exist on the basis of their perceptions of cultural differentiation and/or common descent" (Jones 1997). While common origin is a frequent basis for these groupings, as explained below, there is often slippage between affective and actual relatedness.

I disagree with Yoffee's limiting these entities to those coeval with state-level societies. Large, superordinate categories of social identity that facilitated mutual intelligibility across previously disparate social contexts emerged in a wider range of settings, including the Native North American case outlined above. The coherence of Classic Greek city states and their colonies depended on "reciprocal comprehension" of a general Hellenistic identity, despite its permeability and the maintenance of heterogeneity within it (Antonaccio 2003:58). Many spaces without full-scale states were characterized by shared cultural developments over a broad geographic and chronological range, independent of the trajectories of individual sociopolitical entities within them. I separate this usage from "world civilization," a term I reserve for the six loci of primary urban generation which represent the scalar limit of this type of grouping: Mesoamerica, China, Egypt, the Indus Valley, the Andes, and the Near East (Carrasco 2000:65-67; Wheatley 1971:268-271).

In analyzing civilizations as in-group/out-group and boundary-centric social entities, I tie them to an understanding of ethnicity pioneered by Frederik Barth (1969). This view rejects positivist approaches to assigning individuals to categories, and instead defines ethnic categories as innately rigid while their individual membership is fluid. The boundaries between groups and *emic* perceptions of what these differences represent are the critical means of ethnogenesis (Barth 1969:13). In this way, individuals necessarily describe and define themselves in contrast to the "other" in an effort to maintain social borders that can be transcended. Barth illustrates this process with an ethnographic example of Western Sudanese *fur* millet agriculturalists "becoming" *baggara* cattle pastoralists by accruing livestock and declaring a desire to transition, despite the seemingly distinct nature of these two coexisting ethnic groups. While participants treat ethnic boundaries as immutable, membership within them is fluid based on individual behavior. This process of transformation does not disrupt the borders.

This ties ethnicity with emic conceptions of "us" and "them," in establishing how identity and the self can be understood within communities (Barth 1969:13). Groupings must be understood from the perspective of their permeable boundaries, not immutable characteristics and reified membership (Emberling 1997). If membership is fluid, it suggests that the innate primordial factors often used to bound ethnic groups or nations, such as perceived common descent, can be more affective than actual. There is no "key" attribute required to define ethnicity; it is a social category that must be classified alongside, and can cut across, other differentiations of identity such as class and gender (Emberling 1997; Meskell 2002).

This social constructivist perspective introduced the possibility of instrumental means of ethnogenesis. Depending on circumstances, different scales of ethnicity may be actualized by individuals or groups to provide benefit within a given social milieu. Practical or social reasons draw individuals to form communities; the reasons behind this decision may transcend actual genetic relatedness (Comaroff and Comaroff 2009:41). Postcolonial theorists have adopted this theme under the umbrella of *Strategic Essentialism* (Spivak 1987). This form of instrumental ethnogenesis depends on a power differential so that "subordinate or marginalized social groups may temporarily put aside local differences in order to forge a sense of collective identity through which they band together in political movements" (Dourish 2008:1). Some suggest these instrumental identities are always performed, leading to strain and resistance among their membership, or even that this structure is actively maintained by the dominant group (Alcoff 2000:319-321; Comaroff 1987:314). *Imagined Communities* approached modern state-level societies as depended on socially-constructed identity groupings as well, but from the position of a top-down incorporation event that blurs social differentiation (Anderson 1983). These similarly draw upon primordialist narratives, because their "alleged antiquity validates their claims by rooting them in a seemingly unassailable bedrock of historical fact" (Herzfeld 2005:75). The in-group/out-group mentality that offers a socially actionable framework for ethnic identities can be similarly tied to other types of identity, including, I suggest, the superordinate identity category linked to the emergence of social complexity.

2.1.1 Urban Social Integration

Key to "us" and "them" narratives in early periods of social complexity was that, at first, a comparatively small proportion of a given region's population would be fully sedentary. Even when sedentism emerged as a lifeway, many people would have continued their nomadic subsistence regime, and these individuals would serve as both conduits and producers of their own cultural traditions. In Formative Mesoamerica, Takeshi Inomata (2015) has suggested that Middle Preclassic (1000 - 400 BC) Maya populations at sites like Ceibal, Guatemala remained semi-nomadic when they initiated the construction of public structures. The ability of early sedentary settlers to induce mobile individuals to join their social system would have been critical for increasing the base of power for their communities, fitting with models for wealth in people who can vote through their feet (Guyer 1995; Kim and Kusimba 2008:142). Bourdieu's model of “symbolic capital” and the accumulation of prestige to draw individuals into a social system dovetails with archaeological views of monumentality and early sedentism that emphasize costly signaling (Bourdieu 1984; Speth 2010; Trigger 1990). Establishing a clear division between urban and nomadic life as identity groupings, and persuading people to cross this boundary by becoming part of the community, may have been central to these entities becoming self-sustaining, in contrast to early aggregative complexes like PPNB Gobekli Tepe and Archaic period earthworks in North America (Banning 2011; Saunders, et al. 2005) .

This perspective explains the fixation of dominant groups within “world civilizations” on drawing contrast between urban and mobile life. The idea of civilization-as-identity was used by ancient urban societies to separate themselves from semi-nomadic cultures. Writings from the Bronze Age Near East and China reveal how these “others” were perceived as a danger to the social order (Bahrani 2006; Shelach 2009). In Mesopotamia, this was the most prominent social divide promoted by the elites of centralized state societies. They produced fundamental philological groupings to contrast themselves and other fellow urban states from the perceived nomadic “other” (Bahrani 2006:56). Similarly, in ancient China, "the dichotomy between 'the steppe and the sown' is one of the most powerful metaphors to have shaped the history of East Asia for over 2,500 years” (Shelach 2009:2). While the differences in belief, language, and culture were often less dramatic than presented by ruling elites, their *emic* perception of the contrast is important for understanding how emergent complex societies possessed broader incorporative social identities that made their version of settled life a fundamental identity indicator.

The urban-nomadic distinction drawn by literate Sumerians and Chinese elites reflects the segmented ethnic-like identity that was central to membership within a given “civilization.”

Continued inclusion by the emergent social order would be crucial to maintaining connections to the important networks of exotic objects and ideas that perpetuated the social system (Algaze 2005; Hirth 1978; Kipp and Schortman 1989). Behavioral shifts among smaller centers and cultures in ritual behavior, material culture, or other aspects of lifeways, could have a dramatic influence on their treatment by the political entities that dominated emergent complex groups and these overarching identity spheres (Porter 2004).

This divide between urban and nomadic social groupings was also present in Mesoamerica. The clearest evidence comes from Postclassic Central Mexico, where early-colonial descriptions describe Aztec captive taking and sacrifice from their main urban rival, Tlaxcala. These passages demonstrate how the Mexica felt a comparatively strong connection to their sworn enemy based on shared values and cultural behaviors (Carrasco 1990:65). As described by Diego Durán, those sacrificed from the Tlaxcalan state "will come to our gods like warm breads, soft, tasty, straight from the fire" in contrast to sacrifices from the semi-nomadic Otomi who would be "hard, yellowish, tasteless bread in god's mouth" (Durán and Heyden 1994:231-232). These narratives suggest a superordinate sphere of identity that linked rival urban civilizations surrounding the Aztec empire; one that included urban peoples like Tlaxcala and Mexica, and excluded nomadic ones.

The urban-rural identity boundary is also part of Aztec mythohistory. Their creation myth is a story of pilgrimage from nomadic origins to an urban ethnic belonging (Anawalt 1990). They outline their own transition toward behavior as settled, civilized peoples operating in the mode of the *Tolteca,* as opposed to the barbaric *chichimeca* who occupied the Northern Altiplano (Berdan 2008:214). Paralleling their own story, contemporaneous nomadic individuals who transitioned into urban life (*teochichimeca*), were regarded particularly highly in Aztec writings, paralleling an ethnic transition (Berdan 2008:214). This conception of cosmopolitan power and cross-ethnic integration is explored by Alfredo López Austin and Leonardo López Lujan as the ideological concept of *Zuyua* (2000:28). Participants in the Zuyua sociopolitical system were "an organic hegemonic complex of settlements of diverse ethnicities who inhabited a region" and together "superimposed a multi-ethnic apparatus as the head of the global organization" under a divine unifying order (López Austin and López Lujan 2000:32). The transition to urban life was considered a natural part of the progress of human society; and a strong in-group/out-group mentality aided in its perpetuation (Figure 2.1).

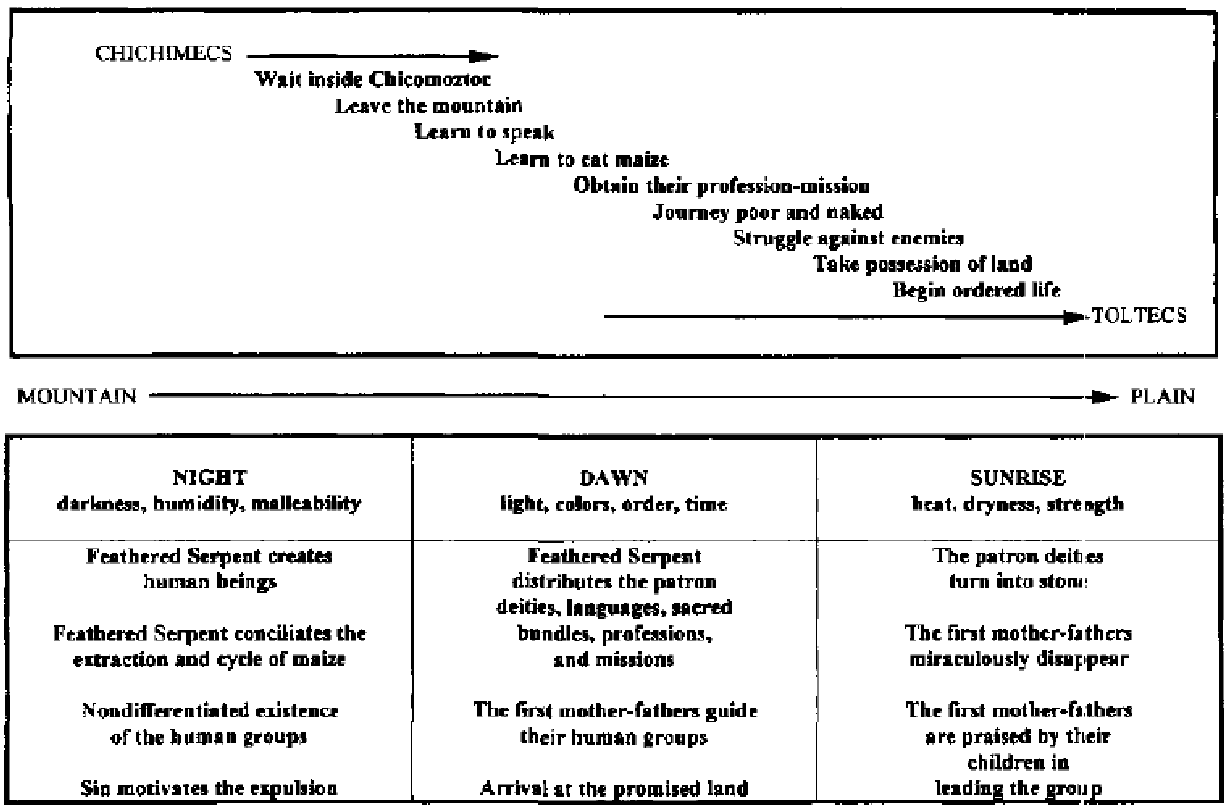


Figure 2.1 Zuyua Human creation progression from origin in nomadic/darkness/chaos to urban life/light/order, as outlined with divine and celestial parallels (López Austin and López Lujan 2000:36)

The desire of Aztec elites to emphasize their carrying of the urban torch was also reflected in the antiquarianism and revival styles they deployed within their capital, Tenochtitlán

(Umberger 1987:69). The Classic period urban centers of Teotihuacan and Tula played prominently into Aztec mythohistories of origin and how they came to be part of the settled Mesoamerican world (Pasztory 1988). They also tied themselves genealogically with the Toltec, offering an agnatic mechanism by which they became the legitimate heirs to urban Mesoamerican civilization (Pasztory 1988:289). This putative genealogical tie extended to ritual enactments as well, where the feather capes worn by Aztec royalty were designed to appear as *Tolteca* capes, a reference to urban progenitors at Tula (Anawalt 1990). Connections with historic urban groups were emphasized to cultivate an ethnic-like identification across states surrounding them.

Identity, then, may be intimately tied to the incorporative process underlying the emergence of social complexity. For communities to assume membership in a broader emergent movement, political, social, or otherwise, they necessarily compromised some part of self-determination. Archaeologists have considered this mutualism between community development and identity at the local level (Canuto and Yaeger 2000). Becoming a member of a community that is settled also meant accepting the overarching identity spheres and civilization overlying it. Yet, understanding how these types of unification events may have occurred at a regional scale has yet to become a research emphasis for formative societies. Incorporative perspectives from anthropological literature instead describe how groups were subsumed by other entities, or alternatively, the modes of resistance to these influences. I suggest that identity driven narratives can be used to effectively characterize how communities moderated, modulated, and influenced regional cultural practices through the agentive actions of their residents.

2.2 Segmented Approaches to Emergent Complexity

A major complication in these identity categories is that they are multiscalar, overlapping, and each level may have boundaries with different criteria (Lightfoot and Martinez 1995). It is not a contradiction when an individual describes themselves in one context as Guatemalan, in another as Mayan, and in another context as *Mam*, a Maya ethnolinguistic group (Gabbert 2006:91). All three are accurate, and even together they represent only a small portion of the individual's identity. There are additional *super*ordinate, *sub*ordinate and coscalar identity groupings that have not been addressed. Beyond ethnicity, these include class, gender, kinship and other emic categories that may be difficult to access in a given archaeological or anthropological case (Emberling 1997; Meskell 2002). In the models of complexity I outline here, newly established "world civilizations" represented the upper scalar limit for these superordinate identity groupings. World civilizations loosely integrated the largest groups of people ever to be within a single identity sphere, but the individuals and groups subsumed within these entities already possessed unique identities like those described above. They situated both themselves and members of other groups within their shared "civilizational" umbrella. The multiscalar nature of these categories produces an analytical problem which can be addressed with the application of segmentation.

The concept of social segmentation offers a framework to study how subjects in emergent complex societies navigated the overlapping, related and mutually supporting categories of their identity without a contradiction of self (Evans-Pritchard 1940). In defining segmentation among tribal society in *The Nuer* (1940), Evans-Pritchard noted that tertiary, secondary, primary agnatic kingship lines can all be integrated into one notion of a unified tribal Nuer in opposition to another group, the Dinka.

> A man is a member of a political group of any kind in virtue of his non-membership of other groups of the same kind. His relations with [other members of the group] are controlled by the structural distance between the groups concerned. But the man does not see himself as a member of that same group in so far as he is a member of a segment of it which stands outside of and is opposed to other segments of it. (Evans-Pritchard 1940:136-137)

In these cases, lower-scale identity groups were not lost. This is graphically demonstrated in the figure below (Figure 2.2). Individuals in Z^1 and Z^2 may temporarily put aside local conflicts to unite under a banner of Y^2 against Y^1. If a broader conflict occurs between these individuals and group X, individuals in Y^2 and Y^1 will form a united front as group Y to confront the menace of X. At the most supraordinate level of political actualization displayed, all individuals in groups Y and X may unite under the banner of B to attack the entity of A. In the case of the Nuer, these groups represent climbing the hierarchy through tertiary (Z^1/Z^2), secondary (Y^1/Y^2), and primary tribal groups (Y/X). Finally, when raids are organized against the neighboring and ethnically distinct Dinka (A), the Nuer (B) tribes put aside lower levels of conflict to unite for this purpose. Larger scale groupings were possible as well; individuals could have become part of an even broader *ethnos* that integrated the Dinka, Nuer, and other tribes into a greater Sudan, without losing these core attributes of their identity.

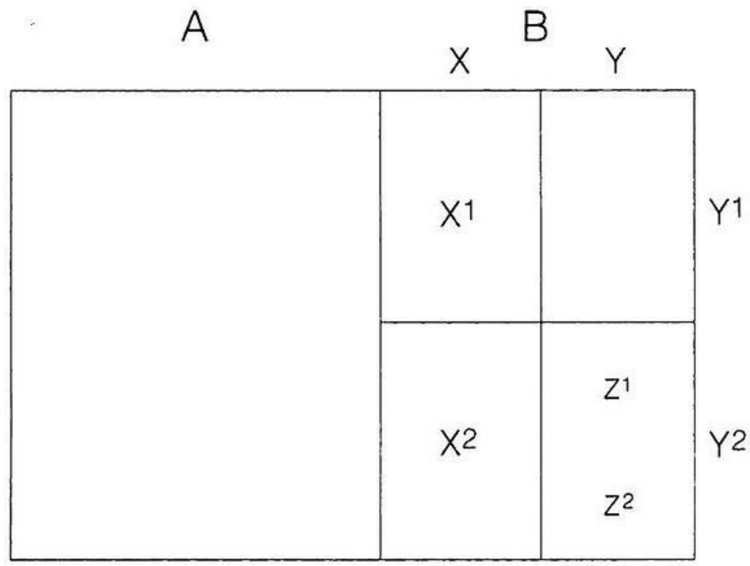


Diagram No. II

Figure 2.2 Segmentation diagram (after Evans-Pritchard 1940)

A state level example can be drawn from 1500's Europe when individual world cities were the most common political unit (Taylor 1995). As time passed, conceptions of territory began to be viewed in a nationalist manner. Cities were incorporated together and "'citizens' began to have first loyalty to state, not city" (Taylor 1995:55). Under the banner of uniformity of "people" as "nation", being grouped into the first nations of Europe (Taylor 1995:54). While individuals in Manchester or London may have maintained their subordinate identity segments regionally, in broader settings they would identity first as members of England. The nation emerged as a new, supraordinate unit identity that built on extant connectivity and modes of collaboration, not by eliminating the forms that preceded it.

The *emic* sense of identity classification and its impact on individual self-projection, following Evans-Pritchard, can also be correlated to Silverstein's interpretation of inhabitable categories of identity as an example of the multivalent voices found within a given "heteroglossia" (Silverstein 2004:639). However, whereas linguistic perspectives treat these identity categories as non-hierarchical, in a segmented model they are necessarily nested. These categorized identity groups offer an organizing principle for sets of social interactions, though there are limits to this heuristic model: "*Ethnic oppositions are segmentary in character*…this mechanism of segmentation does not always create a neat system of concentric circle or 'Chinese boxes of identities', or an otherwise internally consistent segmentary classification system" (Eriksen 1992:172, emphasis in original).

For the individual being incorporated into the type of overarching identity group represented by emergent "world civilizations," it would have been another step in a broader hierarchy of nested identities. A segmentary perspective acknowledges these similarities, and suggests that incorporation required negotiation on a different scale but not necessarily of a different type. As Herzfeld points out, this analogy is critical to the model: "An essential component of the segmentary perspective is that the larger and smaller entities are all moral communities and so share essentially the same formal properties of inclusion and exclusion" (1985:xii).

What allowed geographically and culturally discrete entities to operate within these new common communities, and forge overarching social identity? In contrast to the frequent emphasis on the role of an especially precocious or powerful set of elite individuals, I emphasize the social compacts and collaboration that already existed. These had long drawn people into a variety of smaller scale centers and social groupings that can be observed archaeologically. Commonalities and alliances have always facilitated the development of new identity groups. Elites can influence this process, but their individualized political control would have been capped at the 25-30 km that could be travelled round-trip by a given chief, and no early states with functioning bureaucracies were coeval with the earliest phases of world civilizations

(Spencer 2010:7120). The integration into *civilizations*, then, was another scalar step in a broader set of identity processes which had already been taking place in preceding epochs. This can be illustrated in the Near Eastern case, and the transition from the Chalcolithic Ubaid to the Early Bronze Age Uruk in the 4th millennium BC (Ur 2014).

2.2.1 Applying the Perspective: Approaches to the Near East

The Near East's position as one of the world's earliest "cradles of civilization" has given it a leading role in research paradigms for formative societies. In particular, the early 4th millennium city of Uruk, Iraq and the "Uruk expansion" in which traits associated with this metropolis spread across Greater-Mesopotamia, led to an emphasis on early "hub" centers where individual groups were drawn into the sphere-of-influence of a site's extant, precocious elite (Adams 1981; Nissen 2002). The application of World Systems Theory (WST) to the Uruk expansion was then used to explain this core center's exploitation of peripheral groups by extracting natural resources and providing finished products in exchange (Lamberg-Karlovsky 1975; Wallerstein 1974).

This led scholars of emergent Near Eastern states to emphasize the role of inter-regional interaction and exchange in early cultural horizons of Mesopotamia (Algaze 2005; Frank, et al. 1993; Kohl 1987; Stein 1999). Inclusion of a broader array of regions, classes and sites allows this region to again lead in the development of broader-based approaches to the emergence of complex society. The locus of emergent social complexity is now understood to include interacting centers throughout Northern and Southern Mesopotamia (Lawrence and Wilkinson 2015; Ur, et al. 2007). Research growing out of this new orientation demonstrated heterogeneity in early Near Eastern centers, and the multiplicity of communities that played a role in the emergence of complex society. Scholarship in the greater area has also demonstrated the role of contemporaneous Steppe and Transcaucasian cultures in this process (Frachetti 2012; Smith 2003a).

The first people to inhabit urban centers did not come together from the hinterland and integrate into a new community instantly; they were drawn together progressively, in a stepwise fashion, and maintained discrete boundaries between each other. This can be seen at fourth millennium Tell Brak, Syria, where ceramic patterning beyond the limits of the central tell reveals a series of smaller communities that coexisted around the emergent center before fully integrating (Figure 2.3) (Ur, et al. 2007). The emergence of an overarching identity category, in this case that of Tell-Brak resident, was dependent on trust between these disparate sedentary communities which enabled them to join together in an event that paralleled the lower scale phases of ethnogenesis and political integration which preceded this final integration (Golden and Scherer 2013).

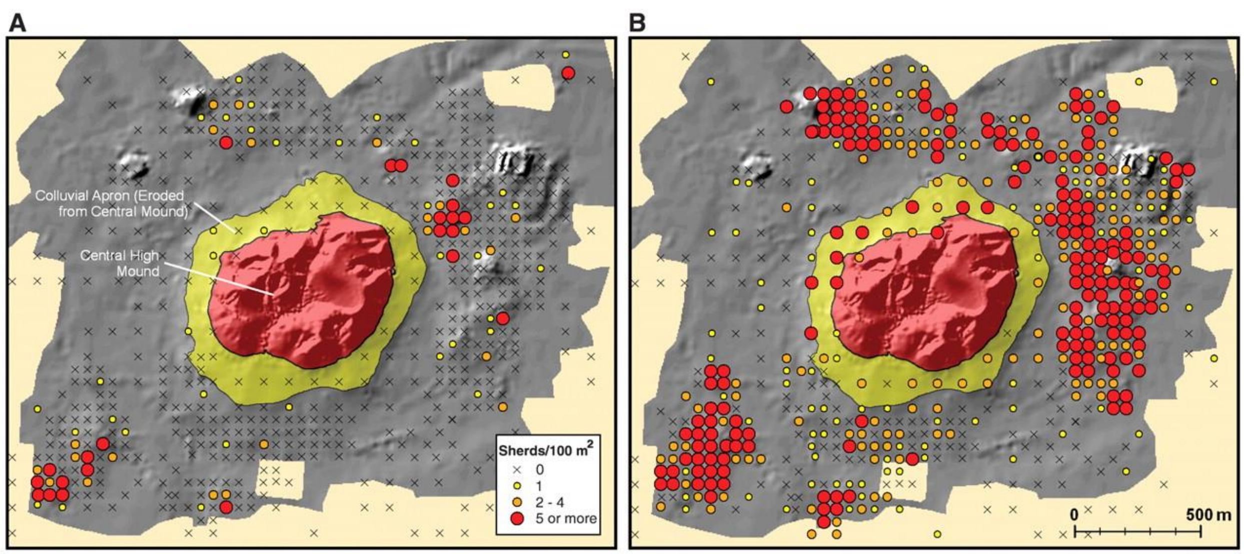


Figure 2.3 Distribution of surface artifacts at Tell Brak, Syria during Late Chalcolithic Phases, showing emergence of sedentary sub-groupings outside of the central Tell before full urban integration (Ur, et al. 2007)

A Near Eastern model that aims to fit these centers and their constituent segmented social groups into a paradigm of kinship has been developed by David Schloen (2001). While focusing primarily on the Late Bronze Age, he lays out a patrimonial model which he suggest extends through multiple tiers, or "nested segments" of identity (Schloen 2001:51). He draws upon first millennium B.C. writings from Ugarit to suggest the "House of the Father" was an organizing principle for rural peoples, and also used as a model for larger scale groupings (Schloen 2001:255). This can be applied to all three classes of bounded political entities defined by Steven Grosby in his exploration of states of the Mediterranean and Near East: the city kingdom, the nation or state, and the empire (1997). The king was the top-tier patriarch in a series of nested chains of agnatic relatedness, much like the tribal model laid out by Evans-Pritchard (1940). Standing identity segments that existed previously were not supplanted by the emergence of these integrated urban communities, but were directly built upon: "kinship, in the metaphorical but meaningful form of the household, remained a durable organizing principle long after the first cities" (Ur 2014:256).

While this segmented perspective is idealized, it offers an overarching organizing principle of relatedness between early Mesopotamian centers and what became this region's world civilization. It in part explains the emergence of slow aggregative growth of "hub" sites like Tell Brak, Tell al-Hawa and Hamoukar which dominated the landscape, but also how they can be usefully compared with unstable groups of "upstarts" that share commonalities (Lawrence and Wilkinson 2015). A series of neighboring centers in which these larger-scale overarching traditions were already present, provides a locus of emergent complexity away from integrative hubs, providing a mechanism of peer polity interaction to explain how they became parts of the same overarching world civilization in the absence of active coercion (Renfrew 1996). These shared values also enabled larger scale political incorporation into empires, such as the Akkadian Empire's establishment under Sargon the Great during the 23rd century BC (Liverani 1993).

Michael Frachetti expanded this perspective cross-regionally by demonstrating how 4th and 3rd millennium transhumant peoples of the Eurasian steppe varied across the institutional profiles documented in the Near East: political structure, ideology, trade and commerce, and subsistence economy (Frachetti 2012:19). The variable uptake of these institutions offer non-uniform metrics of social complexity (2012). As within the Near Eastern sedentary cases, the sub-divisions at the Western Steppe, Central Steppe, Eastern Steppe, and inter-Asian mountain corridor, are one scale within which there were further sub and micro-divisions (Frachetti 2012:12). Establishing complexity as a "multicentered and regionally diverse process" in a contemporaneous space outside the core of Near Eastern primary urban generation, demonstrates the broad base of participants in this process. It also draws attention to the variability in the role of space in the foundation of early complex polities, illustrating the inherent tension in how incorporation and identity manifest on the ground in a range of early societies (Smith 2003a).

2.3 Signaling Incorporation: Reading Objects on the Cultural Frontier

To study the emergence of the cultural horizons associated with civilization-as-identity, it is necessary to consider non-elites within core cultural sites, and the populations of more remote communities. Collectivist perspectives have demonstrated the limits of social change in the absence of mutualism across classes and the role of co-operative processes within societies large and small (Blanton and Fargher 2008; Canuto and Fash 2003; Carballo, et al. 2012; Golden and Scherer 2013). Approaching emergent complex societies with a view toward these segmented identities offers some explanation for the heterogeneity apparent in human societies worldwide, even in early, supposedly homogenized, cultural horizons (Milano 1999; Rice 1993; Tambiah

1977:77). This is especially the case in the incorporative contexts into which these cultural horizons were expanding from "core" centers. These frontiers may share more in common with patterns like European mesolithization and the spread of *Linearbandkeramik* than the spaces between established societies that have been theorized as "borderlands" (Gronenborn 2007; Robb and Miracle 2007; Zvelebil and Lillie 2000).

Borderland perspectives emphasize unique ethnic and cultural identities adopted by frontier peoples and their mediation between "cores" of more centralized cultural groups (Lightfoot 1995:476; Ur and Hammer 2009). They offer a critique of the monothetic ethnic entities which are often described as occupying archaeological landscapes. The expressions of identity that unfolded in these geographically and culturally peripheral third spaces were not bound by fixed values of signs, allowing them to reflect back and have unique impacts upon the cultural developments in "cores" of surrounding cultures (Bhabha 1994:55). They provided a locus for hybridization in contexts as diverse as the ancient Egyptian frontier with Nubia (Smith 2003b), frontier outposts of European colonial powers in North America (Lightfoot and Martinez 1995) and modern cultural displacements along the United States-Mexican border (Anzaldúa 1987; Smith 2002; Vélez-Ibáñez 1996).

Frontiers has proven critical to understanding identity and political trajectories while exploring the soft boundaries between neighboring identity groups, and the sometimes tenuous connections between these groups and individuals (Kramer 1977). Archaeologists have explored the nature of "cultural intermixture" in these regions, through paradigms including syncretism, bricolage, transculturation, and most recently, hybridity (Carlsen 2001; Liebmann 2013:26). In these cases, however, models for frontiers as foci of cultural change and behaviors depend on the extant cultural groups between which they mediate interaction (Lightfoot and Martinez 1995;

Meskell 2002; Parker 2006; Zendeño 2008). Especially in the case of hybridity "some postcolonial scholars advocate restricting use of the term exclusively to situations of distinctly unbalanced power relations (Kuortti and Nyman 2007:2), serving to further emphasize the crucial element of power in hybrid cultural formations" (Liebmann 2013:31), an emphasis on exploitive power that mirrors the canonical use of strategic essentialism.

In contrast to these formalized frontiers with established power differentials, during times of nascent social complexity, core groups were seldom sufficiently developed to generate a borderland population in the sociopolitical sense used above; these represented a different type of cultural interaction (Stein 2005:11). I suggest that, at these stages, these frontier spaces shared more in common with outposts and diaspora colonies in where cultural motifs are absorbed by the populace, but do not supplant the local system (Dominguez 2002; Dommelen 2002:122; Spence 2005; Stein 1999). These incorporative frontiers were less coercive, with the primary tension as one of scalar difference between external trends and local traditions.

The multiscalar process of segmentation described here involves the addition of a supraordinate identity segment without replacing already extant identities or political structures. Individuals in this position are between pressures from the incorporative forces and *benefits* from connections with emergent sociopolitical entities, and the local forces and identity that represent social momentum for the status quo and local senses of self (Porter 2004). At these different levels of actualization, the terms by which individuals signal themselves as in, or out, of any group can vary (Emberling 1997). As archaeologists increasingly focus on *emic* worlds of boundaries, borders, and terrain within complex societies, it offers an opportunity to reassess how ancient peoples conceived of and bound their own worlds during these dynamic periods (Insoll 2007:5).

2.3.1 Interpreting Material Culture

Archaeologists have demonstrated that material culture is a medium for the production of novel signaling, negotiation, and cultural praxis within the contexts described above (Hodder 1982; Mullin 2011; Pancake 1991; Parker 2006). Ethnoarchaeological work has shown how identities can be expressed through objects and apparal that encode articulating and overlapping messages (Hodder 1982; Wiessner 1985). Still, attempts to draw direct-correlations between object classes and identities have been roundly critiqued (Shennan 1989). As Silliman notes in describing dichotomous models of European-Native interaction "unnecessary rigidity in material categories tends to discourage shifting scales of temporal and spatial analysis and to neglect practice and memory, both of which would permit more multiscalar and diachronic views of real historical situations" (Silliman 2009:213).

An example of the multiscalar articulation between material culture and identity comes from the ancient Andean city of Tiwanaku, Bolivia (AD 800-1150). At the broadest *etic* scale, the same decorated pots are found throughout the research zone, in contrast to broader developments in the neighboring Eastern Valley (Janusek 2005:41). Upon closer inspection, variations within the research zone can be found in spatially distinct locations, mirroring a moiety-like division. They are differentially identified as “Lukurmata” and “Tiwanaku” derived ceramics – two neighboring polities which were independent before consolidating in Tiwanaku in 800 CE (Janusek 2005:45). At a smaller scale, numerous individual “barrios” within the city area had variations in burial goods, and fine wares (Janusek 2005:43).

In total, three scales with distinct “segments” can be described by the archaeologist. At a broad scale, the broader Tiwanaku city-state can be contrasted with the neighboring East Valley. At a “medium” scale, two broad groupings within the city state can be seen, spatially mirroring the past borders of Lukurmata and Tiwanaku, despite the fact they are now drawn into a single metropolitan complex. At a the smallest scale under study here, the individual barrios within these two groups show variations as well. The multi-scalar segmented and nested identity groupings of Phase IV Tiwanaku can be reconstructed with an in-depth analysis of metapatterning of material culture (Janusek 2005:49). A linguistic approach, enables further parsing out of these spheres of identity, as well as what is occurring on the ground.

Exploring how these material decisions are made and change through time articulates with Bourdieu's (1977) note that through acts, an individual can reify or modify the cultural structure they are living within, an important tenant that has been built upon by a range of archaeologists (Bowser 2000; Insoll 2007; Meskell 2002; Miller 1998; Silliman 2015). However, in the absence of modern settings which provide full contextual information and the possibility of participant interviews, interpreting material culture can be a confounding process. In coarse interpretations of the scales of identity like the Tiwanaku example above, it is difficult to distinguish the *etic* classifications being made by archaeologist from the *emic* divisions among their subjects of study (Ford 1954; Spaulding 1954). The scholar’s tendency toward classification and grouping can lead to metapatterns of interest that do not advance the interpretation of cultural processes (Herzfeld 1992). Especially in prehistoric archaeology, attempts to understand the messages that were transmitted by objects can be nearly impossible. There are barriers to clearly defining the emic boundaries between alternative “classes or historically constituted blocks” or subcultures within these individual clusters (Patterson 1990:194).

In my interpretation of material remains, I use linguistic anthropological approaches to study the multiple audiences that could be simultaneously addressed through the choices made around objects, instead of trying to decipher the message itself. The means by which messages were targeted, and with whom documented groups shared mutually understood signs, offer an indication of in-group/out-group connectivity. A poetic approach treats material culture on incorporative frontiers as a communicative medium by which core identity groupings could be represented as stable, even as membership within a broader whole could be signaled to new allies. This bottom-up perspective on integration embraces the complications inherent to individual expression within these poetic regimes, and the challenges in finding these signals archaeologically.

2.3.1.1 Poetic Models

The models for the use of language in communication developed by linguistic anthropologists can be usefully applied to archaeological interpretation. In Jakobson's (1960) approach to language, the basic form of communication involves an *Addresser* transmitting information (*Message*) to one or more *Addressees* via a channel of communication (*contact*). The system requires an object of description (*context)* and a code understood by both *Addresser* and *Addressee* which can capture the information (Figure 2.4). In this schematized form, each of these "constitutive factors" of language that can in turn be connected to a corresponding function: referential (*context*), emotive (a*ddresser)*, conative *(addressee)*, phatic *(contact)*, metalingual *(code)* and poetic *(message)*.

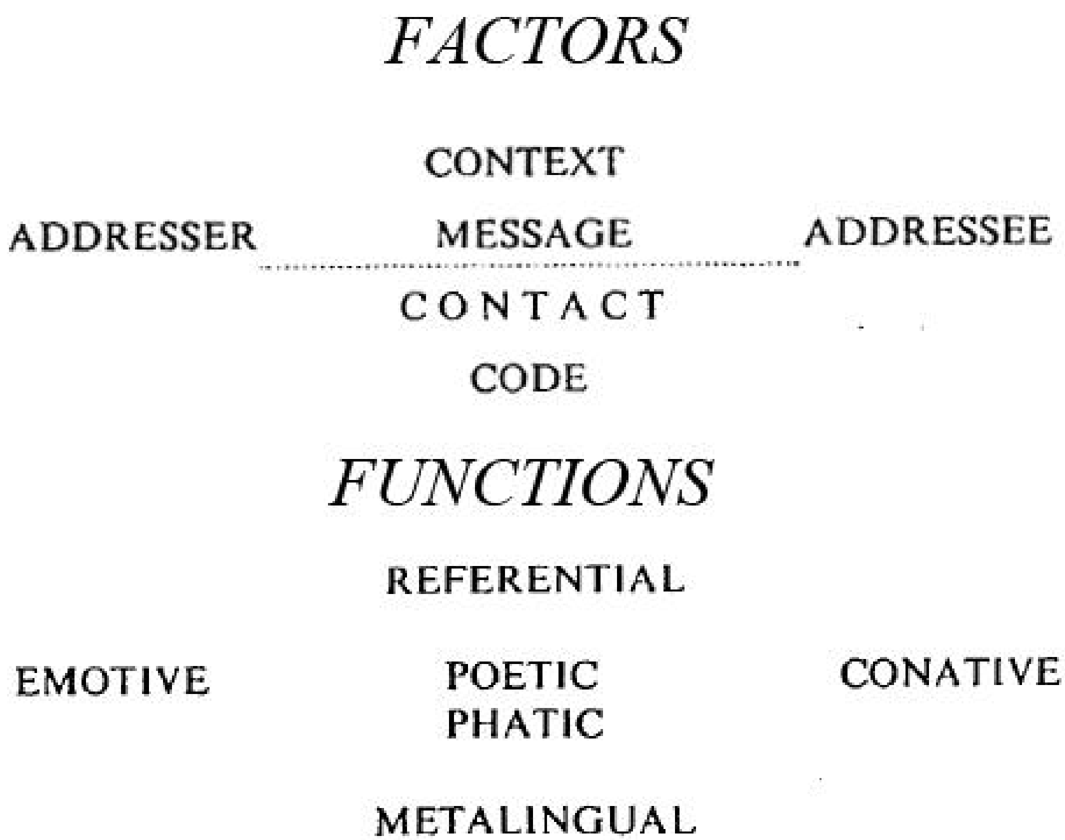


Figure 2.4 Schematic of Jakobson's (1960) approach to language, showing relationship between Factors and Functions

The referential function is that by which a lexical message is sent from an addresser to an addressee (Jakobson 1960:353). This is the most common locus of linguistic study, and is the function addressed in semiotic systems such as in Peirce's Theory of Signs, which defines three separate layers of potential meaning (indexical, iconic and symbolic) in each object, and creates an explicit role for the interpreter in negotiating them (Preucel and Bauer 2001). The emotive function allows the addresser to demonstrate attitude toward a statement or referent, and express whether the direct semantic meaning in a referential function is "true or feigned" (1960:354). The conative function can be used to connote the relationship, and rank or status differences, between the individual who is addressing and the addressee (1960:355). Two of these functions are designed primarily to ensure the successful operation of systems of language: the phatic function confirms that the individual addressing is successfully in contact with the addressee (e.g. can you hear me now?), and metalinguistics are communications that are designed to ensure the code is mutually understood between both parties (1960:356).

How are these ideas constructed, designed, and employed within a message? The five functions described above do not capture the decision making process for individuals who are designing these messages. They are subsumed within the craft of the message itself: the poetic function. The poetic function is described by Jacobson as "the focus on the message for its own sake" (1960:356). It is key to how the other five semantically-loaded aspects of the message can be formed into a meaningful sequence - "the means in which significance is conveyed through actual performance" (Herzfeld 1985:xiv).

Poetics should then be regarded as both a function, and the combinatorics from which different components are selected by the *Addresser* to incorporate into a semantic stream for the *Addressee(s)*. It is the generative process by which communication reflects the intent of the addresser, which Silverstein (1976:13) describes in spoken language as "the speech event." Individuals select from available signs and ordering to best express a given communicative function. These choices represent a signary from which individuals can construct, merge and innovate messages (Caton 1986). The core of messages produced within this poetic model is the strategic presentation of the essentialized social groupings defined and explored above (Herzfeld 2005:183).

A material poetics extends this communicative perspective to objects, modes, and styles. While this parallels Levi-Strauss's use of bricolage, in his structuralist interpretation these signaries are fixed; the individual's "universe of instruments is closed and the rules of his game are always to make do with 'whatever is at hand', that is to say with a set of tools and materials which is always finite." (Lévi-Strauss 1966:17). This removes people's agency to produce and innovate elements (Liebmann 2013:29). Yet, far from being purely determined along structural lines, there is a range of available actions for an individual agent, and their interpretations and understandings of the world do not have to follow the completely hegemonic structure of their culture (Gardner 2008:95). Just as these post-structuralist approaches have acknowledged the agentive ability of the individual to change the social system via structuration, I suggest a revised approach to linguistic-anthropologically derived material signaling that considers the ability of practitioners to innovate within their signary (Bourdieu 1977; Giddens 1984). This notion of "practice" puts the capacity to change the structure back with the individual (Pauketat 2001:74).

Studying the choices and selections being made by individual agents out of their given signary of material culture, and the possible audiences of these choices, offers insights into cultural process. Some archaeologists believe every action necessarily serves to reify *or* modify the cultural structure, making each one of note in understanding human action (Joyce and Lopiparo 2005:369). An emphasis on their actions offers a means of interpretation that does not require an understanding of the full communicative system. Etic patterns of frequencies in material traits and similarity and difference can be read, not as pots equaling people, but as a representation of what audience is being communicated to, even if the content of the message cannot be fully reconstructed (Herzfeld 1992; Kramer 1977). Scholars can use this method to study who messages were designed for, and why. Given the role of material culture in structuring and reflecting identities, a poetic interpretation of the use of objects can also reveal the "how" of practices used to signal diverse audiences through a communicative assemblage.

The use of objects for communication is necessarily contextual. A Postclassic family in Chiapas, Mexico utilizing traditional agricultural techniques to manage a *milpa* of maize, beans, and squash does not seem to actively communicate to an audience, beyond the realm of behavior subsumed under *doxic* action (Swartz 1997). This mode of production has been used in their field for generations, and is similar across the portion of Mesoamerica with which they were familiar: a series of holes produced by hand with a digging stick made of hardwood (Drucker and Heizer 1960:41). While they can deviate moderately in terms of planting date or spacing, they have limited agency in the physical actions and objects used to plant. However, using these same traditional farming techniques in Chiapas in the wake of the maize price collapse after NAFTA in 1994 was loaded with totally different meanings (Gutierrez 1996). Following the *Zapatista* uprising and revitalization notions of ancient human action, growing *milpa* sent a clear message of separation to those local and non-local members of the community as compared to those who have engaged in mechanized mono-cropping (Brandt 2014:881).

It is *context*, defined here as the available options for a given material choice and audiences, that distinguishes generalized material action from material poetics. This parallels and broadens earlier discussions of how technological choices reflect both practical and cultural factors in design (Hosler 1994; Lechtman 1977; Leone 1996; Levy 2006). Even when working with material culture which Binford (1962:219) would firmly classify as *technomic*, context can still load objects like an undecorated digging stick with ideological or semiotic value. In the context of ethnic lines between "us and them," these strategic uses of objects can be used by archaeologist to identify past signaling of membership or relatedness with other groups.

Objects also gain context through their integration into an *assemblage*, defined here as the set of complementary material objects used to transmit particular messages to audiences. It is through assemblages that targeted messages could be transmitted simultaneously to multiple audiences most effectively. For example, using material culture imported from a variety of different origin points and integrating them into a combined poetic act, such as the diverse origin of soils used in incorporative earthen mounds in the North American case from Cahokia described above (Pauketat 2007). Assemblages also offer the versatility of additive and reductive steps in how objects are combined, repurposed, and re-used in future contexts, depending on the expected audience for a given set of actions. Coupled with the actions of the practitioner, this performative interface between the material assemblage and lived behaviors creates final received meanings.

2.3.1.2 Poetics of Incorporation

Material can be interpreted as a component of poetic human action by scholars at several inferential levels. While behaviors are subsumed under a contiguous whole from the perspective of a practitioner and audiences, the ethnographer, historian, or archaeologist is presented with only pieces of evidence. Limited primary data exists for the archaeological interpretant: visual representations of the use of objects in which verisimilitude can be presumed, photographs and video depicting the use of objects, or historic and ethnohistoric accounts of individuals interfacing with material objects and environments. Analogy with this observational data, whether direct historical, direct, or inferential, provides hypotheses for how objects were used for signaling in a given context (Binford 1980; Raab and Goodyear 1984; Wylie 2002). In assemblage form, combining primary data of how the built environment and portable objects, were used within an overall social and cultural system provides insight into possible mutual intelligibility in their usage at different scales. This approach offers archaeology a means to read material remains that complements clear semiotic loading when available, or alternatively, offers a poetic interpretation for audiences when other communicative functions cannot be decoded. For anthropology more broadly, it presents a revised perspective on the relationship between human behavior and material culture.

In attempting to interpret the material signatures of transitions to complexity and the assumption of the supraordinate identity groupings that they introduced, a modified application of "poetics" as outlined by Jacobson can be usefully applied. Analogous interfaces between poetics and segmented identities have been demonstrated ethnographically. Herzfeld (1985) argues that the villagers of Glendi in post-occupation Cypress negotiate social spaces in response to attempts of direct *political* incorporation into an emergent Greek nation and their local interpretation of the Greek *ethnos.* Their actions articulate across varied scales, including Greek, Cretan, Rethimniot and village identity itself (Herzfeld 1985:xii). To understand how these ideas are expressed through poetics and *contemporary* social action, his work presents "an attempt to understand how individuals negotiate the tensions between the congruent but potentially conflicting levels of social identity that are implied by the segmentary model" (1985:xiv). These explorations of identity are tied the system of political incorporation being induced by the Greek Nation-State, present the state as a superordinate moral community that shares core characteristics with the Glendiot community. It is in a difference of scale, not type, just as in archaeological cases of social integration and segmentation.

The largest break in my use of poetics from the case described above is my avoidance of nation-states as an over-arching category of segmented identities. I describe here incorporation within pre-state cultural spaces, distinct from the machinations of politically centralized entities which may have imposed an *ethnos* for particular top-down ends. In cases of early emergent social complexity, including Mesopotamia, Egypt, Indus, China, South America and Mesoamerica, broader identity factors, not state-level integration, had a stronger determining factor in how these new institutions and social equivalences spread. My other major deviation is explicit tying these processes to material culture, instead of the aspects of performance which are more often studied by contemporary ethnographers.

2.4 New Approaches to the Emergence of Mesoamerican Complex Society

I outline here a model where individual acceptance of group social identity was a central facet to the emergence of complex society, not top-down "prime movers" like irrigation, agricultural surpluses, or population pressure. This identity-focused framework for the study of nascent societies of Mesoamerica draws upon heterogeneous and multi-sited paths to complexity which have been demonstrated cross-culturally (Algaze 2005; Bandy 2004; Chang 1986; Cobb 1996; Hall 1999; Shelach and Jaffe 2014; Stein 1999). It also draws upon comparative scholarship on the movement from rural to urban life with modern parallels such as floating populations in contemporary China (Zhang 2001) and the urban movement of modern Hispanic migrant communities (Smith 2002). In all of these cases of cultural integration, it has become clear that these diverse pathways involve individuals balancing and embracing multiple scales of identity.

Studying the transition to complex society as depending upon an analogous process of ethnogenesis that operates at a meta-scales across a series of identity groups yields new insights that complement these perspectives. By placing questions of social integration to the fore, it is possible to ask: how did heterogeneous groups integrate into a unified systems of ideology, inequality and social hierarchy? The closest correlates are other incorporative ethnic identities which have been extensively studied at single scales, and at later phases of human development (Comaroff 1987; Emberling 1997; Jones 1997). I argue that varied scales of identity were maintained even in the earliest stages of emergent "civilizations," as in modern cases of segmented social identities and incorporations into the nation state (Evans-Pritchard 1940; Herzfeld 1985). By employing a poetic approach to incorporation and emergent world civilizations, it is possible to get at the core issues of locality and heterogeneity that have been under-represented in arguments for how these processes unfolded (Jakobson 1960; Silverstein 1976).

Instead of looking for clear lines between cultural entities, this perspective emphasizes the material signatures for both incorporation and for independence, and how they can coexist in the archaeological record. Given members of a social group could, through their material practice, signal different scales of identity to different groups, as needed. This elevates comparatively peripheral geographic spaces, and non-elite individuals, to a central role in understanding the process of early societal incorporations. Frontier regions offer important contrasts with better known narratives that have been written from the cores-outward, with a focus on well-defined central zones of primary urban generation. While these perspectives create clean lines and easily digested maps and timelines, they do not properly represent the complications within the overall system, especially in the earliest phases of emergent complexity.

In the case of Formative Mesoamerica, emergent early centers and the terrain between them is frequently presumed to already carry the essence of "Olmec," "Maya" and "Oaxacan." The negotiation between standing local identities and these cultural horizons is underemphasized, as are the signs of connectivity between these groups at their earliest stages.

At a site like Rancho Búfalo, with a ceremonial core of less than ten percent of the size of integrated communities from surrounding regions, and geographically remote from these “core” regions, is assumed either to already be Olmec or Maya, or alternatively, to be a traditional cultural frontier between the two (Lowe 1977; Ochoa Salas and Ivon Hernández 1977). This fails to capture the more complex reality in the ground. Borderland narratives from Preclassic Mesoamerica that emphasize the Maya and Olmec as essentialized entities constrain interpretations of the rich and multivalent societies that are present in the earliest phase of emergent cultural complexity. The above described concepts of negotiation and material poetics can be used to meaningfully interpret the continuity and changes I have detected through archaeology at Rancho Búfalo.

CHAPTER 3 - DISSOLVING BOUNDARIES: UNIFYING THE EMERGENT MESOAMERICAN WORLD CIVILIZATION

For decades, scholars of emergent complex society in Mesoamerica have focused on the largest Formative centers of Mexico, Guatemala, Honduras, Belize and El Salvador (Coe and Diehl 1980; Estrada-Belli 2011; Flannery and Marcus 2000; Hammond 1991; Inomata, et al. 2015; Neff, et al. 2006a; Saturno, et al. 2006; Sharer, et al. 2006). By the mid-20th century, these sites had already been grouped into the cultural units used today, with boundaries and names that assumed continuity with better understood Classic and Post-Classic period cultures (Caso 1938:94; Ricketson and Ricketson 1937:7; Stirling 1943:3). While archaeology has since moved away from its early emphasis on presupposing normative entities that occupied contiguous sets of terrain, these disciplinary advances have yet to be fully integrated into current Mesoamerican scholarship (Flannery 1972:103; Trigger 2006:2006:246). Modern overviews and maps of the Formative period continue to imply that its residents can be clearly assigned to groups such as the Olmec of the Gulf Coast, the Zapotec of Oaxaca, and the Maya cultures of the Lowlands, Highlands, and Pacific Coast (Figure 3.1).

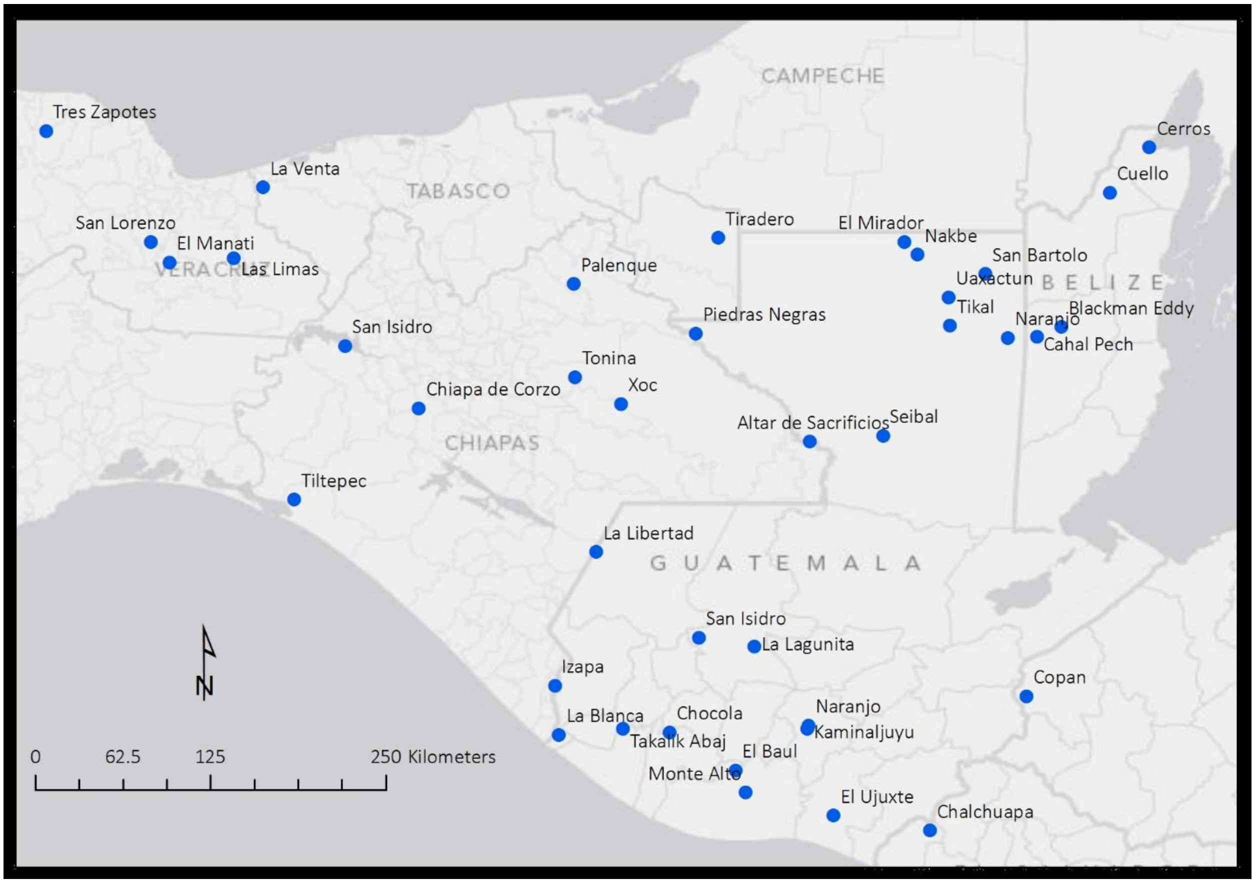


Figure 3.1 Regional site map showing sites and mentioned in the text (J. Dobereiner)

Much of the research that has been performed in Formative Mesoamerica has presupposed the veracity of these categories, and been designed to promote the primacy of one group or another. But just as coarse nomenclature like "Ubaid" has distracted from the range of cultural processes that took place in Chalcolithic Mesopotamia, these Mesoamerican culture-units are beginning to obfuscate more about Formative society than they illuminate (Carter, et al. 2010). As unpacked in the preceding chapter, a more comprehensive approach to emergent complex society must consider non-contiguous boundaries across multiple metrics of social complexity, and diversity in multi-scalar identity categories (Frachetti 2012).

In this chapter, I revisit the culture historical data for the supposedly monothetic Preclassic Maya and Olmec cultural territories through this lens. By outlining the architectural and iconographic diversity within their traditionally defined cultural heartlands I illustrate the shortcomings in drawing them together into separate essentialized entities, and establish an improved framework to interpret "frontier sites" like Rancho Búfalo. Hereto forth, scholars have often typologized cultures based on a single axes of relatedness, while ignoring or overlooking heterogeneity within other material categories. The variability of Formative material culture within the supposed Maya and Olmec regions, and the commonalities that cross the geographic boundaries that are supposed to divide them, suggest this series of cultural classifications are more a product of historical momentum than a culturally meaningful metapattern.

This final point is critical for interpreting Preclassic Usumacinta centers like Rancho Búfalo, which is located between the westernmost sites in the traditionally defined Maya region, and the easternmost centers in traditionally defined greater Olmec region. As shown in this chapter, Middle and Late Preclassic research which has been performed so far in the Usumacinta region has been designed within this traditional borderland paradigm (Andrews 1990; Bravo 2013:14-16; Lowe 1991; Ochoa 1983). This approach can succeed if "Maya" and "Olmec" were culture historical units with internal uniformity; frontier sites located between such groups can be expected to behave as normative borderland centers. However, if commonalities *across* these traditional groupings are acknowledged, and a shared version of essentialized Mesoamerican thought is treated a primary category of identity, a better question to ask of these Formative communities seems to be: what diverse ways did they use to integrate and differentiate themselves from this emergent "world civilization?"

The contribution of my research to this question is twofold. First, it provides a complementary analytical frame to demonstrate how material traits within the traditionally defined Olmec and Maya heartlands flow smoothly into one another. Second, given Rancho

Búfalo's intermediate geographic positioning in a region without the hundred hectare or more centers that characterize most other Formative zones, my work offers a window into how a community with lower population density and smaller-scale centralized authority than has been typically studied integrated this emergent pan-Mesoamerican identity (Love 2011a:51). My approach to cultural negotiation at Rancho Búfalo emphasizes the role of identity and localized forms of adoption of the Mesoamerican "world civilization," while offering insight into the shifting cultural trajectory of the Usumacinta region. It draws attention to the importance of scales of territoriality, and which groups segmented Mesoamerican communities were setup in opposition to – if any. In shifting interpretations of Formative Mesoamerica away from one of incorporation within regional entities like "Olmec" or "Maya", and towards localized interpretations of Pan-Mesoamerican identity and cultural influence, this work demonstrates the continuous series of diversity gradients that existed within these supposedly essentialized cultural spaces.

3.1 Gulf Coast Olmec

The Gulf Coast is a humid, tropical region along the Gulf of Mexico located in modern day Tabasco and Verazcruz, Mexico (Diehl 2000:157). In Pre-Columbian times it linked lowland communities to the south with the highland communities of Central Mexico and Oaxaca. Towards the coast, it is primarily composed of seasonally inundated swampy terrain with little topographic variation or available stone (Cyphers 1996:62). Yet, the Gulf Coast contains some of the earliest settlements in Mesoamerica with monumental structures and sculpture, including the multi-square kilometer centers of San Lorenzo-Tenochtitlán, Veracruz, Tres Zapotes, Verzcruz, and La Venta, Tabasco. These sites have been called "capital" centers of the essentialized Olmec cultural unit of Southern Mesoamerica, which is believed to have occupied the Gulf Coast during the Formative Period (Clark 1997:217). Centers to the west, within the Grijalva River Valley of Highland Chiapas, are described as having fallen under the influence of this Olmec culture (Clark and Pye 2011; Lowe 1977). All are presumed to have spoken Mixe-Zoquean, an ancestral language to the Mixe and Zoque groups that exist today (Campbell and Kaufman 1976:84).

Olmec as a cultural term has its clearest origins in the 1942 Mesa Redonda on "Mayas y Olmecas" in Tuxtla Guitérrez, Chiapas. Alfonso Caso, Miguel Covarrubias and George Valiant advanced the "Olmec" as a group from a time period that pre-dated better understood Classic period Mesamerican cultures (Sociedad mexicana de antropología 1942). This perspective inspired Covarrubias to write about the Olmec iconographic tradition as a Mesoamerican mother culture from which other regional styles like the Maya derived, in *Indian Art of Mexico and Central America* (Covarrubias 1957). It is within this volume that he first presented his iconographic "family tree," showing the development of depictions of the rain deity in different areas of Mesoamerica, and how they share a root tradition established by the Olmec (Figure 3.2).

Figure 3.2 Covarrubias (1957) iconographic "family tree," showing Olmec origin for depiction of the rain deity in different areas of Mesoamerica

Researchers following this 1942 conference have since assigned a particular geographic territory to the name Olmec, and forged it into analytical social unit. Starting at this time, scholars have continued dividing Preclassic Southern Mesoamerica into Maya and Olmec cultural territories (Diehl 2000:162). In particular, the monumental sculpture and style of the Gulf Coast has been central to defining the Olmec as a fundamentally related and integrated cultural group. This basis of definition, however, has become increasingly insufficient with new developments that have demonstrated the widespread nature of the Olmec iconographic canon.

3.1.1 Seeking the "Olmec Style" in Sculpture and Ceramics

Investigations at sites like La Venta, San Lorenzo and Tres Zapotes, have uncovered hundreds of worked stone monuments in the Gulf Coast region. At San Lorenzo alone, over 100 monuments have emerged from excavations in and around the site; the earliest finds include the iconic monumental heads recovered by Matthew Stirling in the 1940's, and the most recent have been found under the remote sensing and excavation program that Ann Cyphers began in 1990 (Cyphers 2001; Stirling 1957). These pieces were carefully integrated in prominent positions among the architecture of Gulf Coast centers large and small (González Lauck 2010). In addition to the labor of their production, many were produced out of a dense basalt stone that had to be imported over fifty kilometers from the Tuxtla Mountains, representing a substantial labor investment (Hammond 2001; Williams and Heizer 1965). The sculptural types include altars that have been interpreted as the first "thrones" in Mesoamerica, colossal heads which are considered possible rulers' portraits, and a broader set of low-relief sculpture which relates to other developments across Mesoamerica (Grove 1973). Following Covarrubias, this distinctive sculptural style was attributed to the Olmec, and that assignment has been maintained, even as carved monuments with similar iconography of rulership, feline deities, and supernatural serpents, have found in a broad geographic range (Carrasco 1990:48; Taube 1995).

This iconographic package putatively crystalized within the Gulf Coast and spread throughout Mesoamerica during the early Middle Formative (ca. 950 – 750 BC) (Clark, et al. 2010:16). Stone monuments are now understood to underlie the political and religious systems which drove belief and societal evolution across the culture region (Clark, et al. 2010; Guernsey 2006). Given their motifs of shamanism and rulership, as well as the labor investment they suggest, these monuments have been cited as an important indicator of the centralized power exerted by rulers of these centers (Taube 2004b:8). While many Olmec low-relief sculpture and sculptures in-the-round now appears to come from comparable dates to other Mesoamerican examples, their Gulf Coast development is still presumed to be the first (Grove 1973; Taube 1995).

One recently discovered low relief carving, the Cascajal block, also raised the possibility that residents of the Gulf Coast region were a central contributor to the Mesoamerican scribal tradition. This serpentine stone was found less than 10 km from San Lorenzo-Tenochtitlán. It was incised with sixty-two signs, and has been tentatively dated to 900 BC through iconography and associated ceramics (Ma. del Carmen Rodríguez, et al. 2006:1611). This date makes it the earliest candidate for Mesoamerican writing. While these signs do not resemble the more familiar glyphs of the Isthmian and Maya traditions, recent work by Alfonso Lacadena has indicated that the origin of Mayan language glyphs are likely to lie with Mixe-Zoque speakers in the Olmec heartland (Lacadena 2010; Mora-Marín 2009). These linguistic and epigraphic developments are discussed at length in Chapter 5.

The sculpture for which the Olmec are best known has been a central tenet of how scholars define them as a people. The iconography associated with these carvings also appears on portable objects, including jade, ceramics, and wood. When it is found across Mesoamerica, it is often assigned to the Olmec, a belief with important implications for understanding the emergence of the Mesoamerican "world civilization" as described above, given that these motifs represent an important social horizon (Andrews 1990; Demarest 1976). The focus on similarities in their monumental regime has kept the focus away from seeking connections among their architecture, lifeways, and other material culture. In summary, Formative Gulf Coast residents are largely presumed to be uniformly Olmec primarily based on the "Olmec style" – despite the uneven distribution of Gulf Coast sculptural types.

3.1.1.1 Ceramics

A recent phase of the debate over the origin of the "Olmec style" was based on the interpretation of Instrumental Neutron Activation Analysis (INAA) provenance data from 725 ceramic samples taken from sites across Early and Middle Formative Mesoamerica, including San Lorenzo-Tenochititlan (Blomster, et al. 2005:1068:1071). The results suggest that the clays of "Olmec style" ceramics were uniformly produced from clays sourced in the Gulf Coast, even when found in distant contexts. This was used to argue that ceramics with post-fire incisions of Olmec motifs, such as the notable "double line break" about the neck, were exported to other centers from the Olmec heartland and seldom produced locally. The authors suggest "Olmec priority in the creation and spread of the first unified style and iconographic system in Mesoamerica," a line which inflamed tensions in the long-standing cultural debate surrounding the parity, or superiority, of the various cultural groups this chapter is designed to deconstruct (Blomster, et al. 2005:1068).

Flannery and colleagues used petrographic analysis to suggest that INAA was a flawed methodology to test hypotheses about the movement of Formative Mesoamerican ceramics, and that the sampling strategy was biased (Stoltman, et al. 2005:11213). They used geographically circumscribed spaces of "Basin of Mexico," "Valley of Oaxaca," and "Morelos" as defined cultural units with which the "Olmec Region" could be compared (Flannery, et al. 2005:11219). Using further anthropological analogues, they noted that one-directional movement of goods out of the Olmec region without clear acquisition of raw-material or gifts from the receiving communities would suggest the Olmec were a client state, not a dominant force on the landscape (Flannery, et al. 2005:11221). From their perspective, similarities in ceramic assemblages between regions can be understood as representing contact, or even extra-regional influence on the Gulf Coast, as opposed to intrusive growth and movement of an Olmec component (Flannery and Marcus 2000:25).

This debate demonstrates continued engagement with, but few concessions by, players studying these issues. Scholars continue to advocate alternatively for a top-down model of the spread of "Olmec" cultural traits, and for multi-regional hypotheses, with clearly defined boundaries between the presumed regions (Neff et al. 2006a; Neff et al. 2006b; Sharer, et al. 2006). These discussions and subsequent studies (Backes Jr., et al. 2012) have made valuable contributions in exploring how materials were exchanged during the Middle Preclassic. They also demonstrate the limits of inferring the nature of Preclassic interaction by focusing on large centers and presupposed cultural entities; there are more options by which to model Formative Mesoamerica than having the Olmec as a primary driving "mother" force, or one of many equal "sister" participants.

Central to the argument for classifying the Olmec as a cultural unit at all is the contested proposal that this iconographic style originated with, or has some degree of primacy among, the Gulf Coast (Clark, et al. 2010:17). Yet, as with sculpture, finds of "Olmec style" motifs on portable objects manufactured across Mesoamerica suggest that this style can no longer be used to delimit them as a distinct cultural entity. Grove (1989) noted slippage between the Gulf Coast Olmec as cultural unit and as a style. Given its widespread presence, he suggested that Olmec was more accurately a name for a Middle Formative art style that was part of a “shared ideological system with attributes derived from many regions of Mesoamerica” (Grove 1989:13).

When exploring the origin of specific “Olmec-Style” motifs, Flannery and Marcus noted there was limited evidence that iconography which is traditionally called Olmec actually originated in the Gulf Coast (2000). Many of these styles are commonplace in Central Mexico and Oaxaca, and often times the individual examples furnished from these regions are of a higher artistic caliber (Flannery and Marcus 2000:12). Celestial motifs from Calzadas Carved pottery in particular, which has been assigned by some to the Olmec heartland, has its earliest known instances in Oaxacan contexts, making this an equally possible origin for the associated pan-Mesoamerican belief systems surrounding the sky and the earth (Marcus 1989). This has important implications than the idea of Olmec primacy, and in turn, how they can be defined.

For the Olmec, including the main centers of La Venta and San Lorenzo, and extending to communities like Tres Zapotes, El Manati, and Laguna de los Cerros, the case for uniting them into a single cultural unit has been largely driven by iconographic unity. It is now clear that this iconographic system influenced early artistic traditions across Mesoamerica, and was intimately tied to the long term development of cross-regional religious and political institutions. Only a small subset of this iconographic system, including monumental heads, did not spread beyond the Olmec area – and similar head-boulder monuments have been found in Maya Highland sites like Monte Alto (Guernsey, et al. 2010; Parsons 1986:44). In order for archaeologists to definitively separate the Olmec from other surrounding groups, then, there should be unity in other axes of material culture. Burial traditions and crania cannot be easily analyzed, due to the acidic soil which has destroyed nearly much of the osteological remains in the Gulf Coast; the Olmec are generally a people without attested skeletal human remains (Tiesler 2010:303). Alongside ceramics, which are explored within Chapter 5, a remaining domain in which to seek this uniformity or diversity with the traditionally defined Olmec cultural unit is within their architecture, long a key component of arguments used by archaeologists to draw centers together into the etic cultural units.

3.1.2 Building the Olmec City: Architecture in the Gulf Coast and Grijalva River Valley

The three largest centers which have been classified as belonging to the Olmec Culture are San Lorenzo-Tenochtitlán, Veracruz, La Venta, Tabasco and Tres Zapotes, Veracruz. These sites are often discussed as successive Olmec "capitals," despite substantial overlap in their occupation histories (Clark 1997:213). Indeed, the basis by which they are considered to be central Olmec centers is the presence at all three of carved monumental heads of uniform style, which likely share a comparatively close chronological origin (Clewlow, et al. 1967:11; Pool 2008). Comparing the architecture of these major centers to one another, and then widening the exploration to explore other centers in the traditionally defined Olmec territory, reveals the Gulf Coast region as one of tremendous architecturally diversity. The broad range of site plans is more than variation on a theme; there is little to fundamentally connect the architecture at these centers to one-another.

San Lorenzo-Tenochtitlán was the first of the monumental Gulf Coast communities to be founded, and by 1400 BC was the largest in the Gulf Coast region. The site complex occupies a anthropogenic earthen super-platform at the center of a periodically flooded plateau by the Coatzacoalcos river, with nearly 6-8 million cubic meters of construction that represents 14-18 million person hours of labor (Cyphers and Zurita-Noguera 2012:138). Its massive size is complemented by an array of carved sculpture, and access to extensive trade networks (Hirth, et al. 2013b:2979). In traditional narratives of emergent Mesoamerican complexity, it is described as the inaugural settlement of a qualitatively different political system than preceding groups like the Ocos of Chiapas – perhaps even the first Mesoamerican state (Chase, et al. 2009:178; Diehl and Coe 1996).

While San Lorenzo's massive earthen platform is among the most impressive examples of early monumentality in Mesoamerica, it was not replicated at other centers within the Gulf Coast or beyond. There are few superstructures on top of this platform, and the handful of low platforms and sunken plazas that were constructed used techniques that did not spread across the Gulf Coast (Cyphers and Di Castro 2009:32; Wendt and Cyphers 2008:180). There is a single possible administrative structure at San Lorenzo; a mound at the north of the site referred to as the "Red Palace" (Cyphers 1997). This low earthen platform was distinct in the presence of a series of wide basalt columns and hematite stained sand floors. While it complements sculpture as a likely indicator of rulership, its architectural form does not appear in other Mesoamerican sites. Instead, the earliest Preclassic centers with royal precincts that match with examples from Mesoamerican archaeology and ethnohistory appear in Preclassic Oaxacan centers like Monte Alban and San Jose Mogote (Spencer 2003). The architecture of San Lorenzo also lacks structures which become commonplace across Mesoamerica, including some like ballcourts that predate its founding (Hill, et al. 1998).

Further, while San Lorenzo's orientation generally follows the north-south directionality that dominated early built environments of Mesoamerica, the structural regime does not form a clear primary site axis (Figure 3.3). This contrasts with the centrality of directionality and solar alignments in contemporaneous and later centers of Mesoamerica (Aveni 1980). Especially in the period of early social complexity, buildings like solsticially aligned E-group complexes were used as astronomical observatories for rulers to forge ties between the sun and seasons, and legitimate their power (Aimers and Rice 2006:80; Rice 2008:280). Going forward, Mesoamerican rulers continued to use iconography, architecture and their knowledge of astronomical and landscape features to establish and maintain control (Brumfiel 2011; Fash and

López Luján 2009; P. M. Rice 2007; Saturno, et al. 2012). This was the basis of the mound-plaza architecture which came to dominate sites plans across Mesoamerica.

Figure 3.3 Topographic map of San Lorenzo-Tenochtitlán, Veracruz (Coe and Deihl 1980)

Mound-plaza architecture is absent from San Lorenzo, even in its final phases (Cyphers 2001; Joyce 2004). This absence is dismissed as diversity in monumental forms, with a note that the site foundation transforms "the landscape itself into monumental architecture," but this fails to explain the discrepancy between San Lorenzo and other cases (Neff, Blomster, Glascock, Bishop, Blackman, Coe, Cowgill, Cyphers, et al. 2006:116). Even within the Gulf Coast region, mound-plaza architecture is present at other supposed Olmec centers, such as La Venta, Tabasco.

La Venta is less than 100 km to the east of San Lorenzo, and is a central example of the mound-plaza architectural regime (Drucker 1959). Like San Lorenzo, the site is located in a comparatively wet climatic region, near the delta where the Tonala River meets the Mexican Gulf Coast (Pool 2001). At its peak, La Venta's site core occupied 200 hectares on top of an naturally elevated platform, and dominated a three tier settlement hierarchy (Pool 2001; Rust and Sharer 1988). La Venta also contained early tombs, massive offerings, and a complex series of monumental sculptures. The occupants of this site used the same “Olmec style” iconographic assemblage and monumental heads which characterized San Lorenzo, but their style of building was dramatically different (Drucker 1952; Stirling 1943). Whereas San Lorenzo has been presented as a possible point of origin for the iconographic assemblage which came to dominate Mesoamerican art, the architectural plan of La Venta’s ceremonial center has been proposed as prototypical for the design of later Mesoamerican communities (Figure 3.4) (Clark and Hansen 2001).

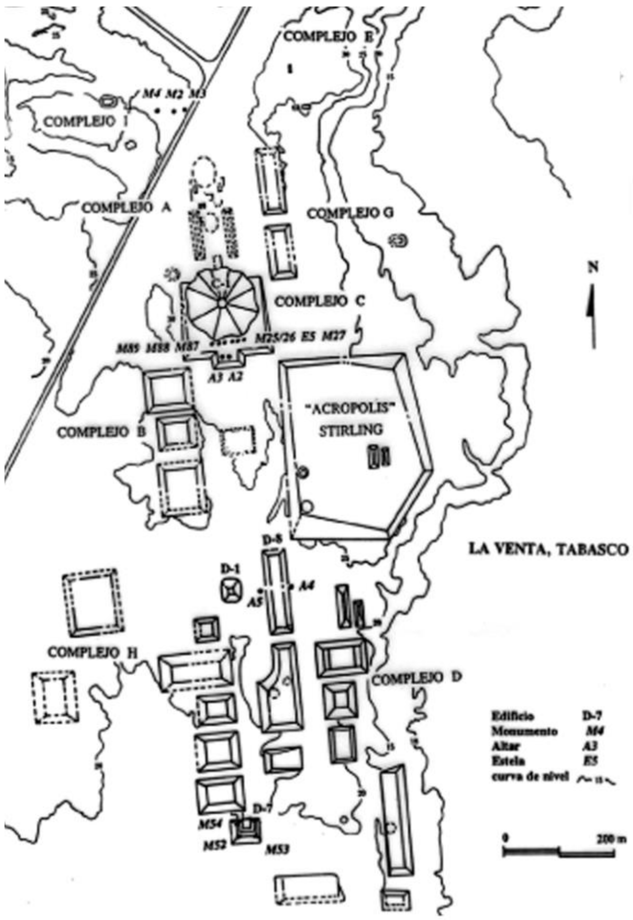


Figure 3.4 Site map of La Venta, Tabasco (R. Gonzalez Lauck 2004)

This "Middle Formative Chiapas Plan" (MFC), is central to a broader theory of Olmec primacy in emergent Mesoamerican complex society. This model suggests that the Olmec of La Venta crystallized this architectural plan, before it was adopted by several satellite Mixe-Zoque sites in the Grijalva River valley and Coastal Chiapas (Clark and Hansen 2001). In contrast to San Lorenzo, La Venta's MFC architectural regime included the mounded architecture associated with most centers across Mesoamerica, including a massive pyramidal structure, as well as possible E-group and ball court ceremonial structures (Pool 2001). These were integrated into a holistic north-south site plan that may represent a cosmogram oriented towards the sun and an artificial sacred mountain, one of the first examples of a tradition that became commonplace throughout Mesoamerica (Carrasco 1990:49). This prototypical architectural regime consists of from north to south: a large pyramidal structure, a substantial low eastern platform, at times with a paired ball court structure on top, and at the far south, a radial pyramid directly west of a range structure that together serve as a solstitial observatory complex called an E-group, which served as a primary ritual area (Clark and Hansen 2001; Doyle 2012)

While there are generalized parallels between the Gulf Coast and Grijalva Rivery Valley centers, a generalized look at architecture within the Gulf Coast-region reveals tremendous heterogeneity. Besides La Venta, the only Gulf Coast center that shares some aspects of the MFC is Cerro de Las Mesas, and its occupation intensifies primarily during the Late Preclassic (Evans 2008:289; Stark 1991) (Figure 3.5). Others differed entirely; both Laguna de los Cerros and the ritual site of El Manatí, while possessing of Formative occupation and artifacts, are now not believed to have any structures during that time (Cyphers 2004:16; Ortíz and Ma. del Carmen Rodríguez 1999:246).

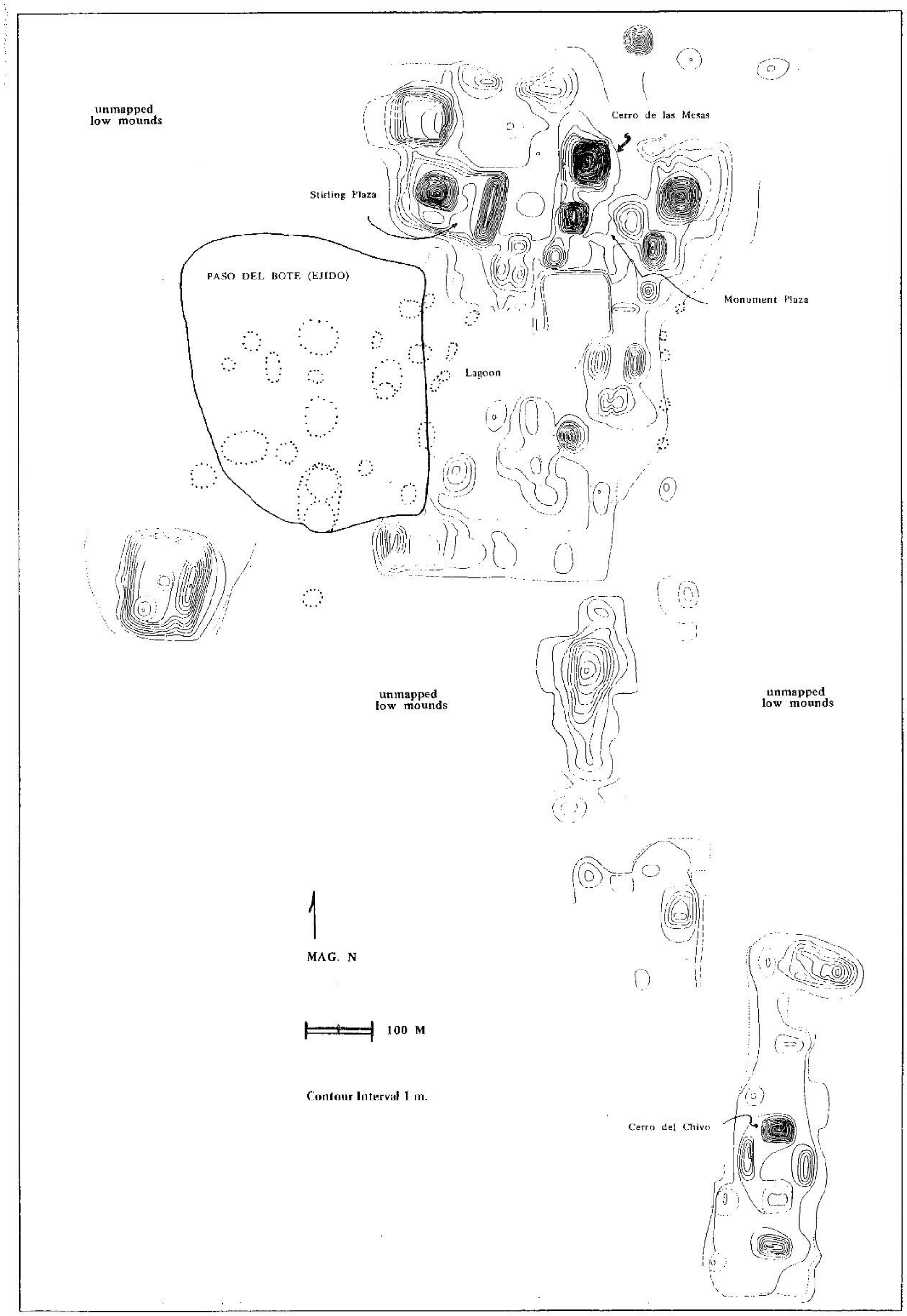


Figure 3.5 Site map of Cerro de Las Mesas (Stark 1991:5)

Tres Zapotes, the third largest Olmec center after La Venta and San Lorenzo, is made up of four architectural subgroups defined by conical and long mounds (Figure 3.6). It follows a generalized East-West alignment throughout its Formative occupation, starting with Group 1, which may date as early as the Middle Preclassic (Tres Zapotes) phase (Pool and Ohnersorgen 2003:24). These subgroups were built and used contemporaneously, a stark contrast to the dominance of single major architectural core groups at La Venta or Cerro de las Mesas (Pool 2008:129). While the site has internally consistent rules that constrain its constructions, few are shared beyond the local Papaloapan Basin of Veracruz (Pool 2008:128). The architectural plans used in these major Gulf Coast communities are not uniform, or even similar.

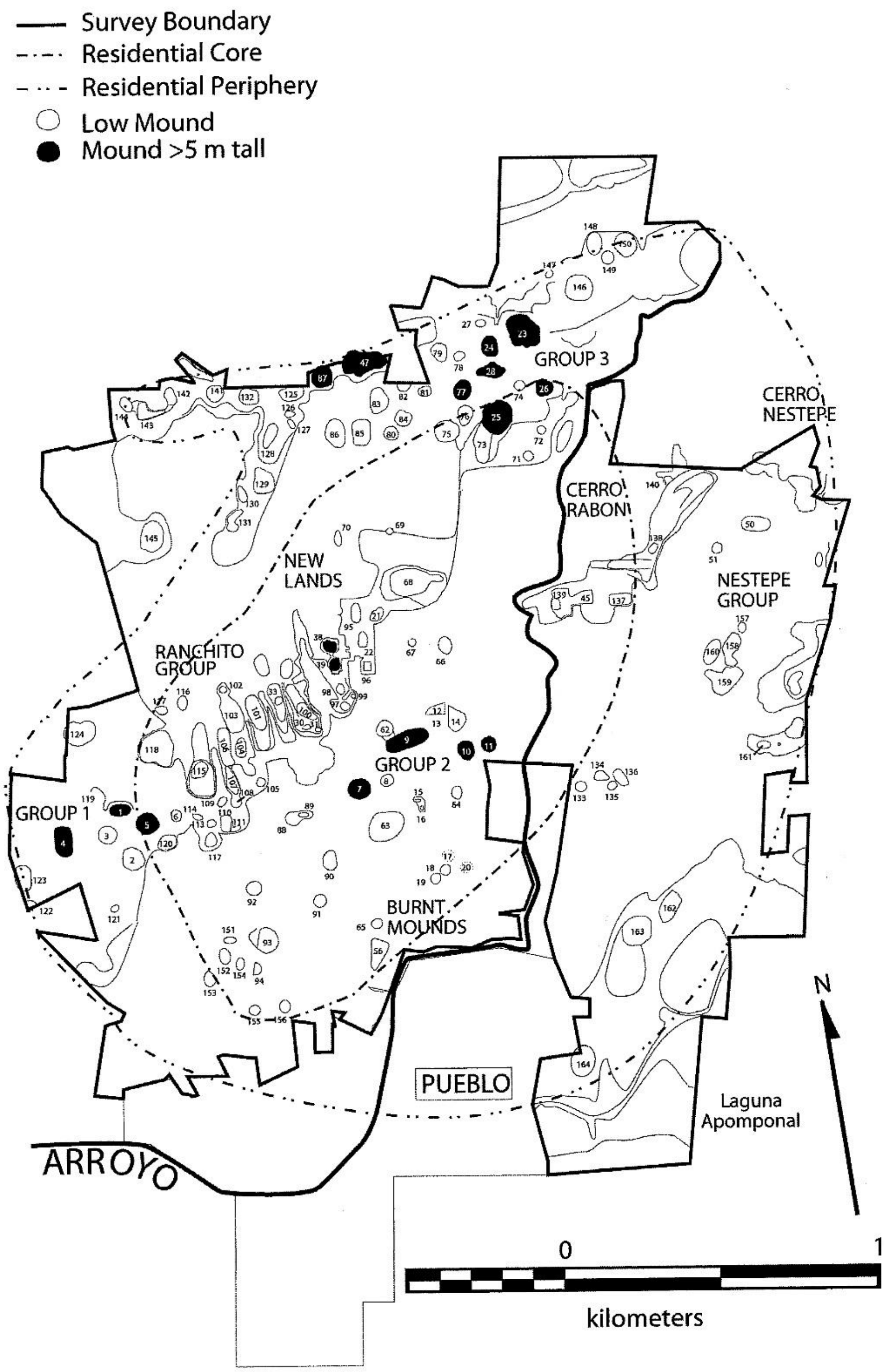


Figure 3.6 Site map of Tres Zapotes, Veracruz (Pool 2008:130)

East of the Gulf Coast, Clark and Hansen (2001) have proposed several sites in the Grijalva River Valley were related to the MFC architectural plan, including the Chiapas sites of Chiapa de Corzo, Mirador, and La Libertad (Figure 3.7). However, architectural sets associated with it are variably distributed across Mesoamerica, and some of these MFC plans have now been found as far east as the Maya area – perhaps even ones that predate these Gulf Coast examples (Inomata, et al. 2013). That this architectural pattern crossed the supposed Maya-Olmec boundary on a unified chronological horizon suggests that it cannot be used to analytically circumscribe either group.

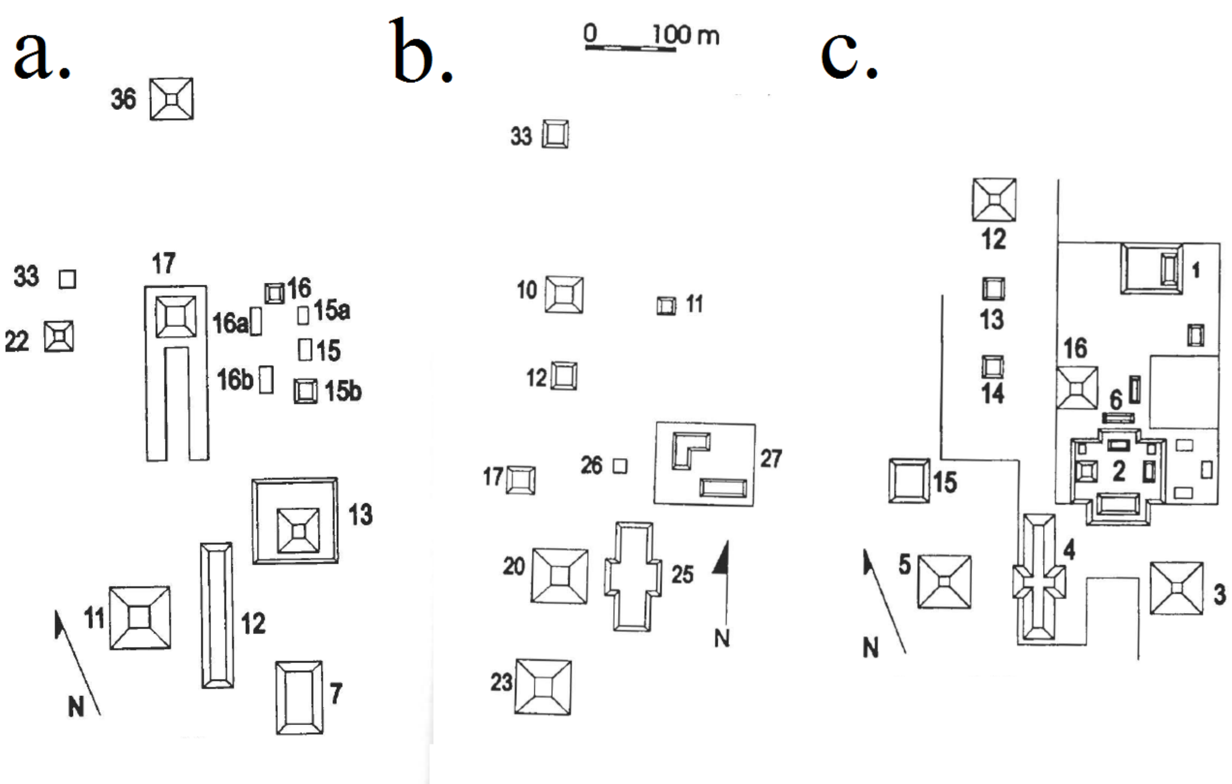


Figure 3.7 Site maps of Chiapas Grijalva River centers with supposed MFC architectural plans: (a) Chiapa de Corzo (b), Mirador, (c) La Libertad (Clark and Hansen 2001)

This diversity within the Olmec region's architecture, alongside the presence and development of similar styles well beyond the Gulf Coast, parallels the diffuse origination of the "Olmec style." Both no longer appear to be Gulf-Coast specific phenomena. This necesitates a reassessment of how related "Olmec" centers should be considered, in the absence of two primary cultural axes upon which they have been defined as part of a single essentialized culture unit. Geographic proximity and a small subset of unique local sculptural traditions such as monumental heads and sculpture in the round are the primary remaining factors that draw these centers together, to the exclusion of other parts of Mesoamerica. This is a continuing step in the move away from viewing the Olmec, or their neighbors, as consolidated, unified cultural units (Brown 1984). Especially upon considering information from the eastern centers within the traditional Maya heartland, definitively classifying the Olmec as a separate cultural unit seems a weaker argument than considering a diverse array of local interpretations of a broader set of shared traditions and ideas developing through cross-regional interaction across Mesoamerica.

3.2 Middle and Late Preclassic Maya: Lowland and Coastal Perspectives

"Mayan" is a language family that diverged from other American languages approximately 5,000 years ago, and contains approximately thirty indigenous dialects spoken in Mexico, Honduras, Guatemala, Belize and El Salvador (Campbell and Kaufman 1976; Houston 1994; Kaufman 1976:102). Archaeologically and linguistically, they are believed to have rapidly diverged at the end of the Preclassic (ca. 100 AD), but "Maya" is used as shorthand for a range of Pre-Columbian and modern cultures that live in this region (Dahlin, et al. 1987:369). Broadly, scholars have divided the Maya into Lowland and Highland subcultures, along with expected archaeological correlates (Kaufman 1976:104). The Lowland Maya occupied the tropical forests of Petén, Guatemala and extended across Belize and the Mexican states of Yucatán, Campeche and Quintana Roo (Freidel and Shaw 2000). The Highland, or Southern Tradition, includes the mountainous and coastal regions of southern Guatemala, the Mexican state of Chiapas, and portions of Honduras and El Salvador. These have at times been grouped under the umbrella of the "Preclassic Southern Maya" (Love 2011b; Sharer 2000). As with the Olmec, an in-depth analysis of the diversity of the Preclassic communities within and between these regions reveals more points of difference than similarity.

While the Olmec's emergence as a disciplinary entity began with finds of a previously unknown sculptural tradition that captured the mind of early 20th century Mesoamerican scholars, the Preclassic Maya were proposed as a cultural entity based on Carnegie Institute's work at Uaxactún and Kaminaljuyu (Kidder, et al. 1946; Ricketson and Ricketson 1937; Shook, et al. 1952; Smith 1955; Wauchope and Ricketson 1934). A century of work on the Maya had already firmly established the "Old Empire" and "New Empire" models in the minds of these Mayanists; when earlier material started to be found, it was presumed to be of a smaller and less developed precursor (Morley 1946:211). These Preclassic peoples lacked the ceramic and sculptural traditions, long-count calendar system, and hieroglyphic inscriptions that had been used to define Maya civilization. Ian Graham's assertions of El Mirador's early dates raised interest, but did little to drive the consensus towards a complex Preclassic (Graham 1967). For the following decades, most scholars considered the "Preclassic" Maya as a prelude to the more refined Classic period (250 AD – 850 AD), while their relatedness to later cultures was accepted uncritically (Kidder 1947; Kidder, et al. 1946; Ricketson and Ricketson 1937; Shook, et al. 1952; Smith 1950).

Scholarly perception has now shifted towards understanding the Preclassic Maya as equally sophisticated to, and containing many developments traditionally associated with, the Classic period (Sharer 1991:181). David Freidel's and Norman Hammond's work in Belize challenged models of a fully developed complex society emerging only in the Classic period (Freidel 1979; Hammond 1992). Freidel (1979) asserted that the ecological and processual models being applied to the Classic Maya could be projected back in time. His work at Cerros indicated that the architectural growth, population density and kingship that were used to define the "Classic" were already well developed by the Late Preclassic period (Adams 1977a; Rathje 1971). His model of a unified Late Preclassic interaction sphere has been further substantiated by the emergence of convergent styles of architecture and *chicanel* ceramics that formed a Late Preclassic horizon in the Maya Lowlands (Aimers and Rice 2006; Freidel and Schele 1988; Hammond 1999; McAnany 2006).

Research confirming the early dates of construction at El Mirador, Guatemala has been used to further refine this argument (Hansen and Guenter 2005; Šprajc, et al. 2009). While the dataset about Formative Southern Mesoamerica have grown steadily, the presumption of uniformity and relatedness of "Maya" through time and space has persisted. Increasing evidence of diversity across the Preclassic Maya region requires a reexamination of whether the Maya should be considered a discrete cultural unit at this early stage, and how, or if, there can be a clear divide established between the Olmec and Maya cultures.

3.2.1 Preclassic Maya Architectural Regimes

The MFC architectural plan described above has been used as a central interpretive tool to understand architecture in southern Mesoamerica and the accompanying spread of other metrics of complex society (Clark and Hansen 2001). While the relationship of Rancho Búfalo's built environment to this proposed architectural plan is explored more extensively in Chapter 4, it is important in exploring uniformity and diversity in architectural communities of the traditionally defined Preclassic Maya region. Recent research on the emergence of the MFC and its architectural correlates and suggests that it was present in some, but not all, early Maya communities. Similarly, E-groups, which occur across the Maya area are now understood to have been developed cross-regionally along with the Gulf Coast (Clark and Hansen 2001; Doyle 2012).

This is but one dataset in a range of findings that illustrate heterogeneity throughout Preclassic Southern Mesoamerica, from sites like Ceibal, Guatemala, Yaxuna, Yucatán and others (Clark and Pye 2011; Estrada-Belli 2011; Garber, et al. 2004; Inomata, et al. 2015; Inomata, et al. 2013; Rosenswig 2010; Stanton and Ardren 2005). A focus on MFC examples from the Lowland Maya sites of Ceibal and Cival is of particular importance in discerning similarity and difference from the Gulf Coast and Grijalva River region (Estrada-Belli 2011). The E-group structure at Ceibal, Guatemala, located 175 km southwest of Rancho Búfalo on the La Pasion tributary of the Usumacinta, is now known to have been the first architectural assemblage at the site, ca. 1000 BC, predating other aspects of the MFC, and perhaps La Venta itself (Figure 3.8) (Inomata, et al. 2013).

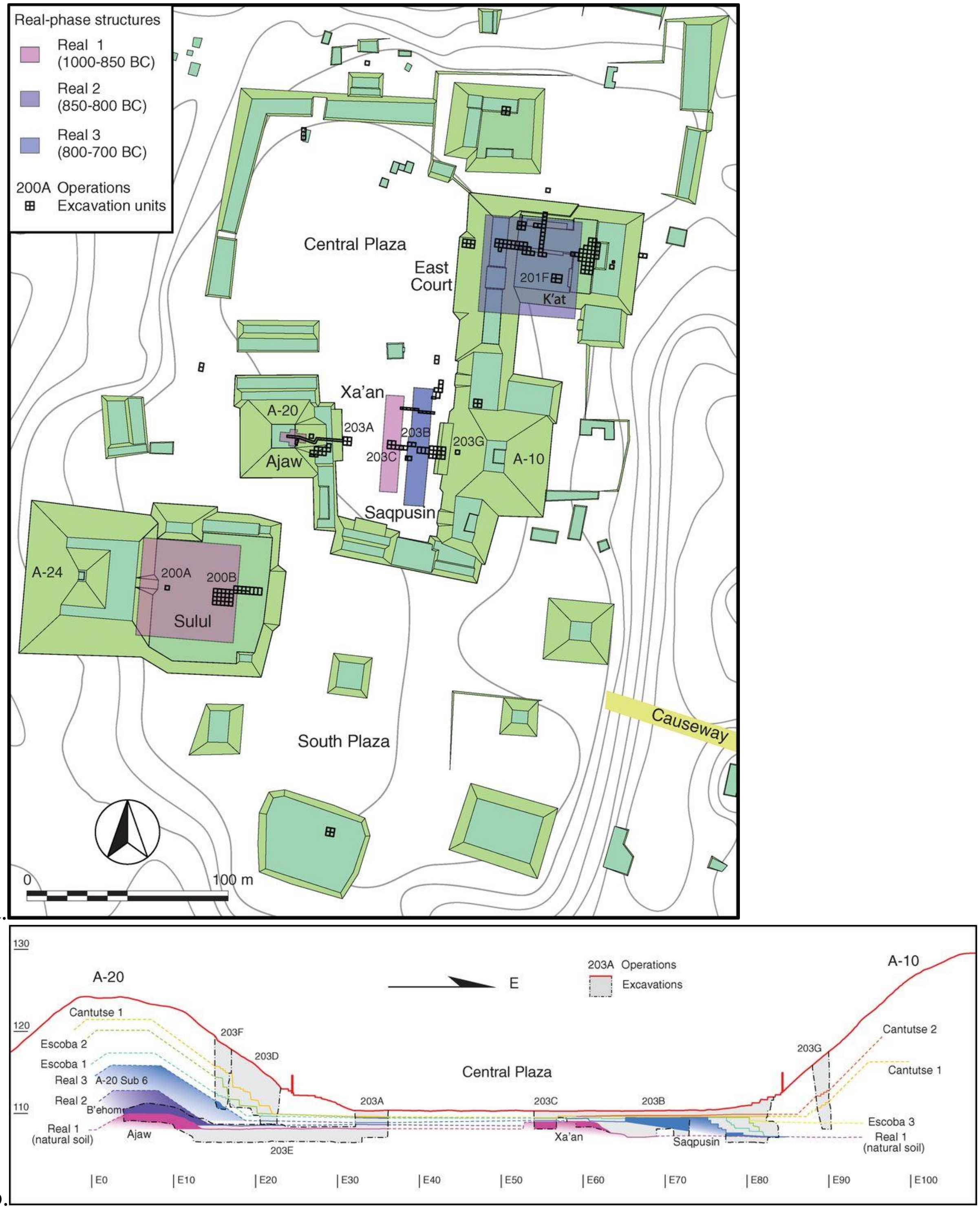


Figure 3.8 Middle Preclassic architecture at Ceibal, Petén, Guatemala: (a) site map, (b) profile of earliest E-group structure phases (Inomata et. al 2013)

There are also questions about the centrality of mounded architecture in community aggregation events in the Maya area. The most important event surrounding the founding of

Cival, Guatemala, 150 km northeast of Ceibal, was the flatting of terrain and filling in of the area between two natural hills to make a 500 meter wide artificial plaza space (Figure 3.9) (Estrada-Belli 2011:69). This leveling, taking place in an archaeological "instant" as short at 50 years at approximately 800 BC, preceded more traditional mounded constructions built by later residents of Cival (Estrada-Belli 2011:75). Their early buildings included a substantial E-Group, one of the earliest known from the Maya Lowlands (Estrada-Belli 2006:58). The inaugural construction of this group was commemorated by a series of caches, which are also evocative of interregional interaction and broader pan-Mesoamerican traditions (Bauer 2005).

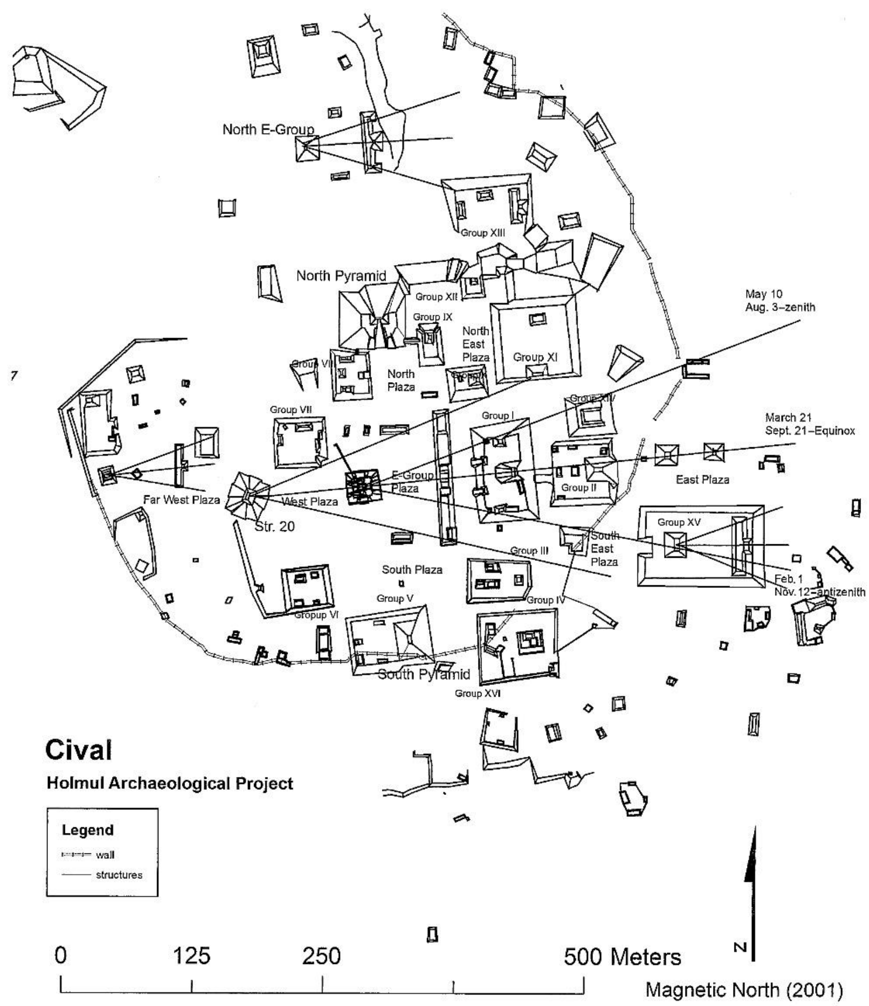


Figure 3.9 Site map of Cival, Petén, Guatemala (Estrada-Belli 2001:68)

3.2.2 Non MFC Architectural Plans in the Lowland Maya Area

Several Maya centers diverged entirely from the MFC plan, even within the Middle Preclassic period. Most prominent was Nakbe, Petén, Guatemala a 50 hectare site located 130 km north of Ceibal within the Mirador Basin (Hansen 1998:56). By 800 BC the architecture at the site was composed of low masonry platforms, with sascab and clay floors, taking a range of forms and orientations (Velásquez 1993). When major groups of 3-8 meters in height were constructed starting at 600 BC, they followed a highly compressed east-west long axis, without MFC traits like a north-south orientation and several of its associated architectural sets (Figure 3.10) (Clark and Hansen 2001:18).

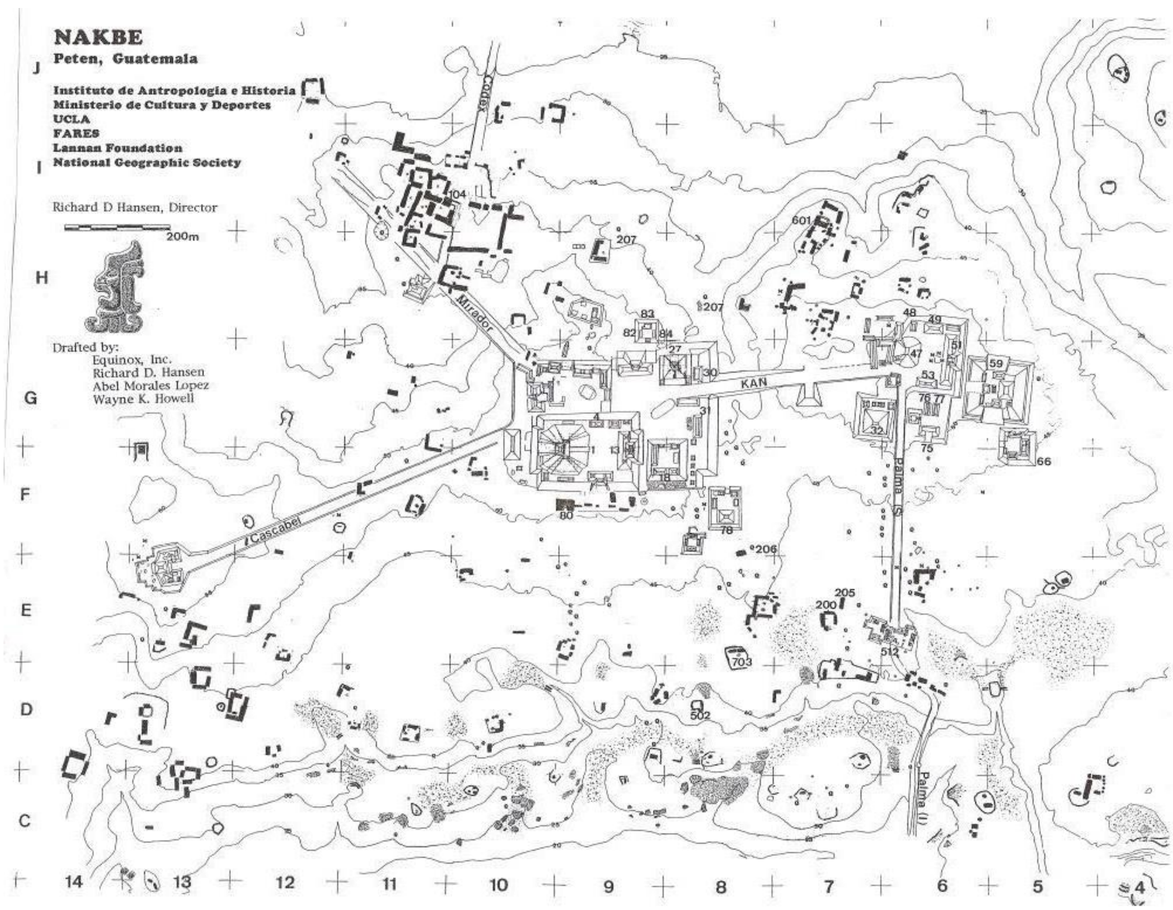


Figure 3.10 Site map of Nakbe, Petén, Guatemala (2003 Informe of PRIANPEG)

The only strong relation between Nakbe and MFC centers within and beyond the Maya area is the presence of paired architectural arrangements like E-Groups and ballcourts (Hansen 1998:63) By this time, however, their construction had already become standard practice across Southern Mesoamerica; both in the Olmec and Maya geographic spaces (Aimers and Rice 2006; Doyle 2012; Hill, et al. 1998; Taladoire 2001). Another similarity between the majority of these Middle Preclassic centers, along with other Petén sites like Tikal and Uaxactún, is the presence of what may be an early royal compound – “an ordered series of small building platforms” around an 80 square meter plaza. However, these courtyard groups are present on both sides of the supposed Mixe-Zoque/Maya boundary (Clark and Hansen 2001:20).

Entering the Late Preclassic, El Mirador exhibits a clear transition away from the Middle Preclassic architectural cannon, and at 1,600 hectares, emerges as the largest Maya-area center in any period (Graham 1967; Hansen 1990; Love 2011a). It also has the highest estimated population of any Preclassic Mesoamerican center, between 60,000 and 100,000 individuals (Demarest 2004; Fowler, et al. 1989:159).   The site is believed to have been a hegemonic force, or even a regional Maya state, based on its rank-size position (Hansen 1990; Howell and Copeland 1989; Matheny 1986). Its position at the top of a four tier site hierarchy has led some to assert it influenced trade and politics across a broad area (Dunning and Beach 2011; Estrada-Belli 2011:52; Hansen and Guenter 2005; Houk, et al. 2010; Sharer 1992:131).

El Mirador’s architecture maintained the east-west directionality that originated at Nakbe, and came to predominate among Maya site plans during the Classic period (Clark and Hansen 2001:18) (Figure 3.11).   It features some of the largest architectural complexes known from the Maya area; the sprawling El Tigre covers an area larger than Tikal’s central Plaza, and the Dante Triadic Group terminates a full 72 meters above ground level (Hansen 1990; Howell and

Copeland 1989; Marcus 2003:85). It also contains a giant E-Group structure, with G212 resembling E-VII-Sub at Uaxactún, but substantially higher at 34 meters (Hansen 1998:67). Despite these similarities, and a reliance on E-groups, ballcourts, and triadic groups, the site is singular in size and form; no other center in the Lowlands is even half as large or developed during the Late Preclassic (Hansen 1990; Šprajc, et al. 2009).

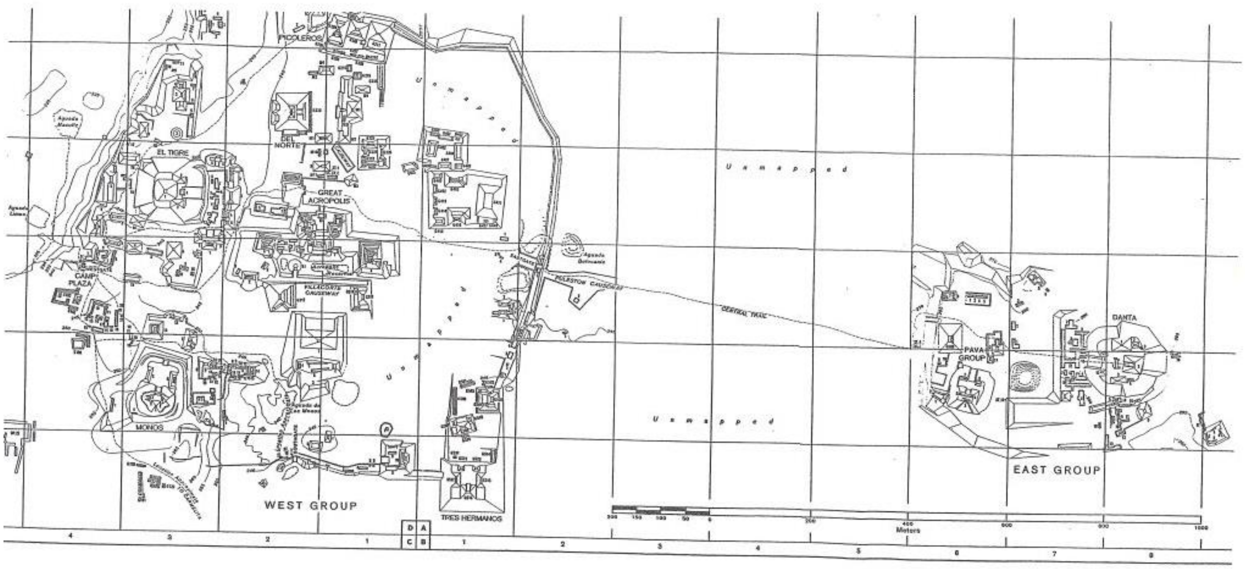


Figure 3.11 Site map of El Mirador, Petén, Guatemala (1983 Proyecto El Mirador)

Rather than being able to characterize an entire culture area based on its presence, El Mirador's precocious development makes clear that it is a singular sociopolitical entity. It has even been proposed as the seat of a prototypical Maya empire, one exceeding the territorial extent of Classic period dynasties based at Tikal and Calakmul and exerting control over material wealth and imports across the Maya area (Freidel and Schele 1988; Reese-Taylor and Walker 2002). This dovetails with Classic Maya narratives on the Calakmul "Dynastic Vases" surrounding the origins of the Ka'an dynasty, and has led scholars to hypothesize about its emergence from the El Mirador kingdom (Gunn, et al. 2014; Marcus 2012; Martin and Grube

2008:102; Pincemin, et al. 1998:312). Critically, however, empires circumscribe ethnically and culturally *heterogeneous* region, and are characterized by "territorially expansive and incorporative kinds of states, involving relationships in which one state exercises control over other sociopolitical entities" (Sinopoli 1995:5) In keeping with other Pre-Columbian super-states like Teotihuacan and the Aztec, the Maya cannot be considered a cohesive entity based on their possible domination by a singular site like El Mirador; let alone during Middle Preclassic phases before its emergence (Carrasco 1999; Hare 2000; Smith and Montiel 2001).

3.2.3 Highland Maya Architectural Planning

Until recently, the Southern Maya area and Highlands of Guatemala were viewed as the earliest source of many of metrics of social complexity now attributed to the Lowlands (Kaplan 2011; Kidder, et al. 1946; Parsons 1986; Shook, et al. 1952). Kaminaljuyu was the largest center in the Maya Highlands, with a clear Middle Preclassic occupation, and a final florescence during the Late Preclassic period. One of the few major obsidian sources in the Maya area, El Chayal, was located less than 50 km from the site core, facilitating the site's access to powerful trade conduits and a widely used commodity (Asaro, et al. 1978:439).

During the Late Preclassic, Kaminaljuyu developed into a 900 hectare complex, with a concomitant regime of monumental sculptural and writing (Guernsey, et al. 2010; Kaplan 2011; Love 2011a; Mora-Marín 2005; Parsons 1986). The site consisted of pyramids, platforms and administrative structures, oriented at 20 degrees east-of-north, and subdividing a series of architectural clusters facing centralized plazas, not unlike the Tres Zapotes settlement (Figure 3.12) (Kaplan 2011:253). The largest structure, E-III-3, was 20 meters high, over 6000 square meters at the base, and contained a variety of ornate tombs loaded with offerings (Shook, et al.

1952). These interred individuals were long considered the earliest kings known from the Maya area in any era. Recent applications of Bayesian statistics to carbon dates throughout the highlands, however, have shifted the long-standing Shook-Kidder ceramic chronology almost 300 years (Inomata, et al. 2014). This work demonstrates that writing, architecture, and political systems in this area developed in parallel with, not in advance of, the Maya Lowlands. Generally, the orientation of these structures, and the design of the architectural complexes resembles Lowland Maya examples from contemporary periods; there is a similarly widespread presence of ball-courts, E-groups, and triadic groups (Aimers and Rice 2006:80; Arroyo and Henderson 2014).

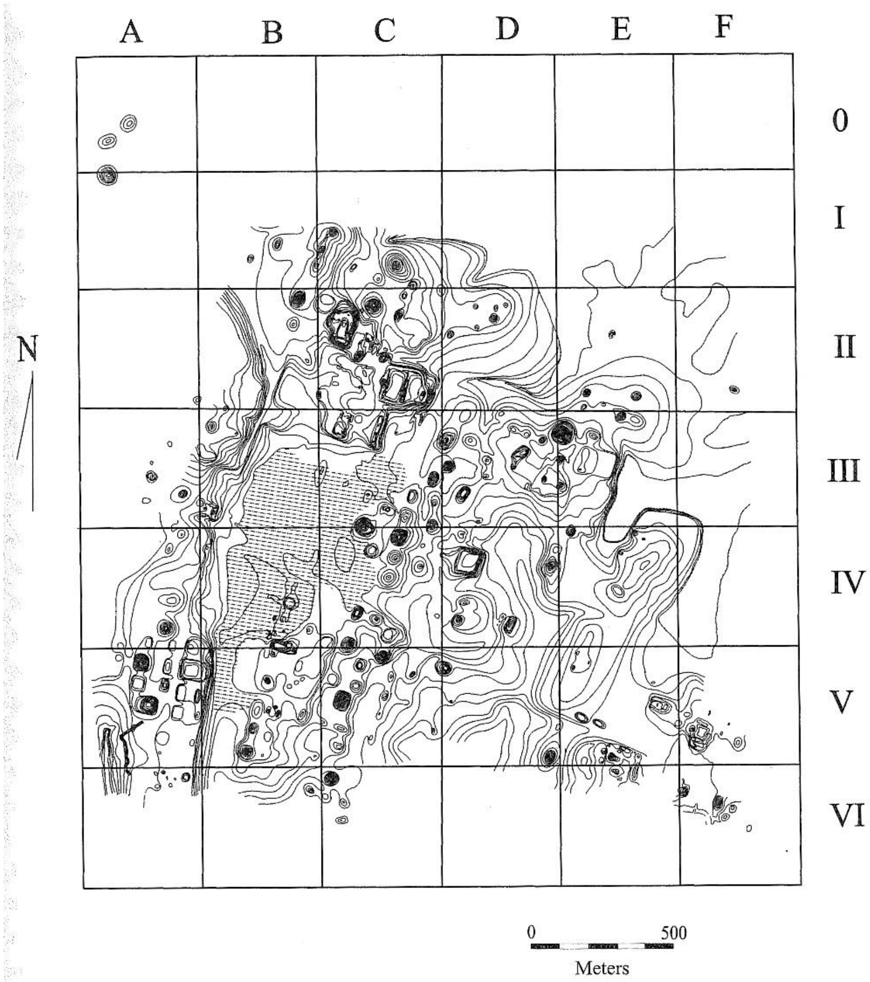


Figure 3.12 Site map of Kaminaljuyu, Petén, Guatemala (Kaplan 2011:241)

South of Kaminaljuyu, along the Pacific Coast, was El Ujuxte, Guatemala, which emerged as a regional center in 600 BC and had similar access to highland obsidian sources, but had little in the way of resemblance to Kaminaljuyu's architectural plan (Nance and de Leeuw 2005). The site core is 400 hectares, and consisted of at least 250 mounds arranged generally 35 degrees east-of-north with a series of corridors separating them (Figure 3.13) (Rice 2007:133). There is a ceremonial acropolis with seven "singular temples," and a 22-meter pyramid around which residential houses are placed (Love 2011a:54). No clear E-Groups or triadic groups can be discerned in the site plan, though there are possible paired structures like ballcourts. The site itself little resembles any contemporaneous centers. Given this heterogeneity, it is difficult to present the Southern Maya Area is a cohesive whole through their architectural plans – let alone to draw them clearly together in an ethnolinguistic collective with the Lowland Maya. Broader similarities cross-cut these supposed regional boundaries, and most any similarities across architectural regimes tend to occur as localized interpretations of broader emergent traditions of Mesoamerica.

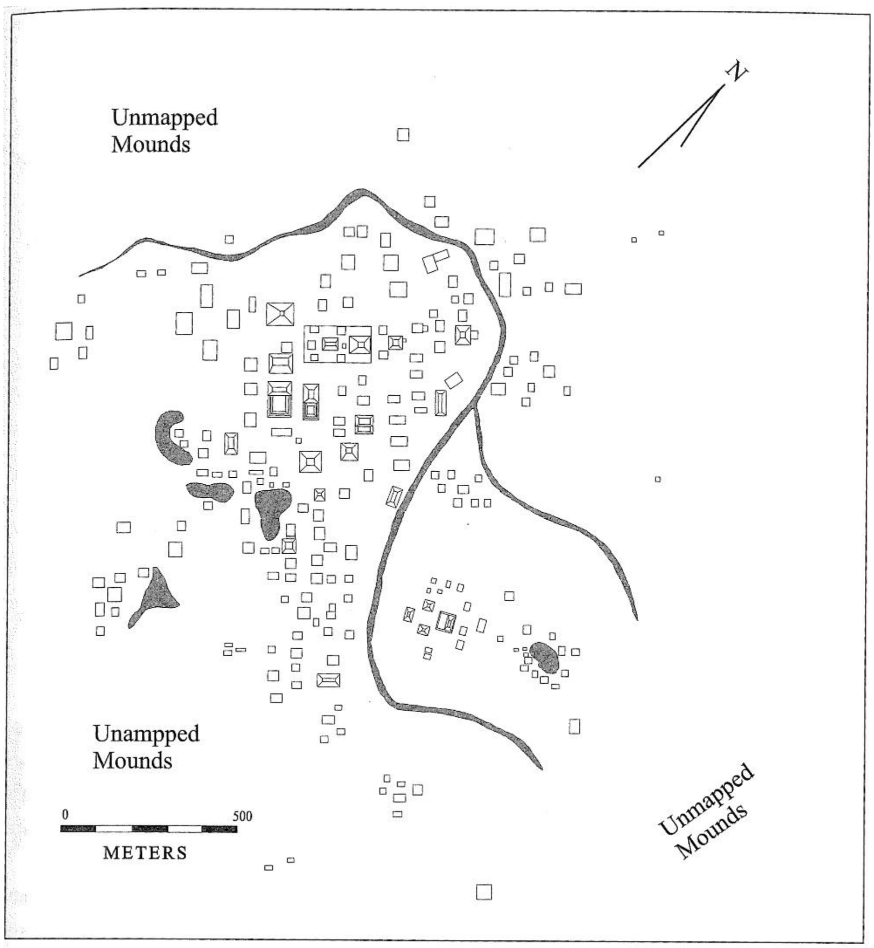


Figure 3.13 Site map of El Ujuxte, Guatemala (Love 2011:5)

<u>3.2.3.1</u> *Iconography and Sculpture*

Iconography and epigraphy has also been used to circumscribe the Maya area as a discrete cultural unit, and in an attempt to draw ethnolinguistic continuity with the Classic period. As with architectural plans, however, there is heterogeneity within the monumental sculpture of site across the Maya region and their accompanying ceramic. Similarly, the region's iconographic regime shared many aspects with the "Olmec style" associated with the Gulf Coast. In particular, sculpture of Izapa, Tak'alik Ab'aj and La Blanca can be explicitly tied with the Olmec area; whereas these were treated as a chronological "missing link" to the later Classic Maya, now these sites are increasingly interpreted as part of a geographic frontier that had its own commonalities and differences, and chronological overlap with the Highland Maya to the east (Norman 1973; Smith 1984).

Izapa, Chiapas, in particular, has occupied a unique art-historical position based on its geographic position between the traditional Olmec and Maya heartlands (Norman 1973). The dynamic and visually active style is unique to the site, though ties can be drawn between it and other Preclassic Mesoamerican traditions (Figure 3.14) (Kappelman 2004:99). Increasingly, it is understood as one of many traditions within and beyond the Southern Maya region, one of several uses of stelae "symptomatic of the amalgamation and centralization of power at selected Late Preclassic sites" (Kappelman 2004:99). It ties directly into traditions from Tak'alik Ab'aj in Pacific Coastal Guatemala, as well as Kaminaljuyu further inland (Parsons 1986). The motifs at Izapa themselves are now viewed as fitting into a broader narrative of the Principle Bird Deity - again, a cross-regional phenomenon, but one which takes a unique physical form within the Izapa iconographic regime (Kappelman 2004:117).

Figure 3.14 Izapa Stela 4, example showing highly symbolic and active iconographic style on site monuments (Kappelman, 2004)

While few early stone monuments come from the Preclassic Lowlands, examples like Nakbe Stela 1, Uaxactún Stela 10, Cival Stela 2, and several pieces from El Mirador exhibit similarities to the political-centric monuments that are known from the Highland examples like Kaminaljuyu Monument 65 (Figure 3.15) (Estrada-Belli, et al. 2003; Graham 1986:159; Hansen 1992; Henderson 2013; Parsons 1986). They depict individual personages which are rulers or god-impersonators, some with captives and possible name-glyphs (Mora-Marín 2005:64). While Highland examples were once believed to pre-date the Lowland examples, these regions have now believed to have developed coevally (Inomata, et al. 2014). Though they contain motifs that evoke later, Classic period monuments which accompany Maya *ajaw*-style kingship, they also share a range of similarities with the broader tradition of low-relief sculpture which can be tied to the "Olmec Style" (Clark, et al. 2010).

Figure 3.15 Preclassic Maya area monuments: (a) Nakbe Stela 1, (b) Uaxactún Stela 10, (Graham 1986) (c) Cival Stela 2 (Estrada Belli 2003), (d) Kaminaljuyu Monument 65 (Kaplan 2000)

Another monument type that cross-cuts the sub-regions of the Maya area are the so-called potbelly or "barrigones" (Figure 3.16) (Rodas 1993). These are a Middle to Late Preclassic boulder sculpture representing "often rotund human figures, carved in the round from boulders, with distinctive facial features that typically include puffy faces with closed eyes and puffy eyelids” (Guernsey 2010:221). Examples have been found most commonly along the Pacific Coast at sites such as Izapa and La Blanca, but also in the highlands, and at Lowlands sites such as San Bartolo, Petén, Guatemala (Sharpe, et al. 2014:99). These have been interpreted as possible domestic sculptural types that were outside the realm of elite-control (Guernsey 2010:223). This makes them of particular import that they appear across a broad range of Preclassic Maya sites, and have a greater uniformity of style than "elite-level" monuments.

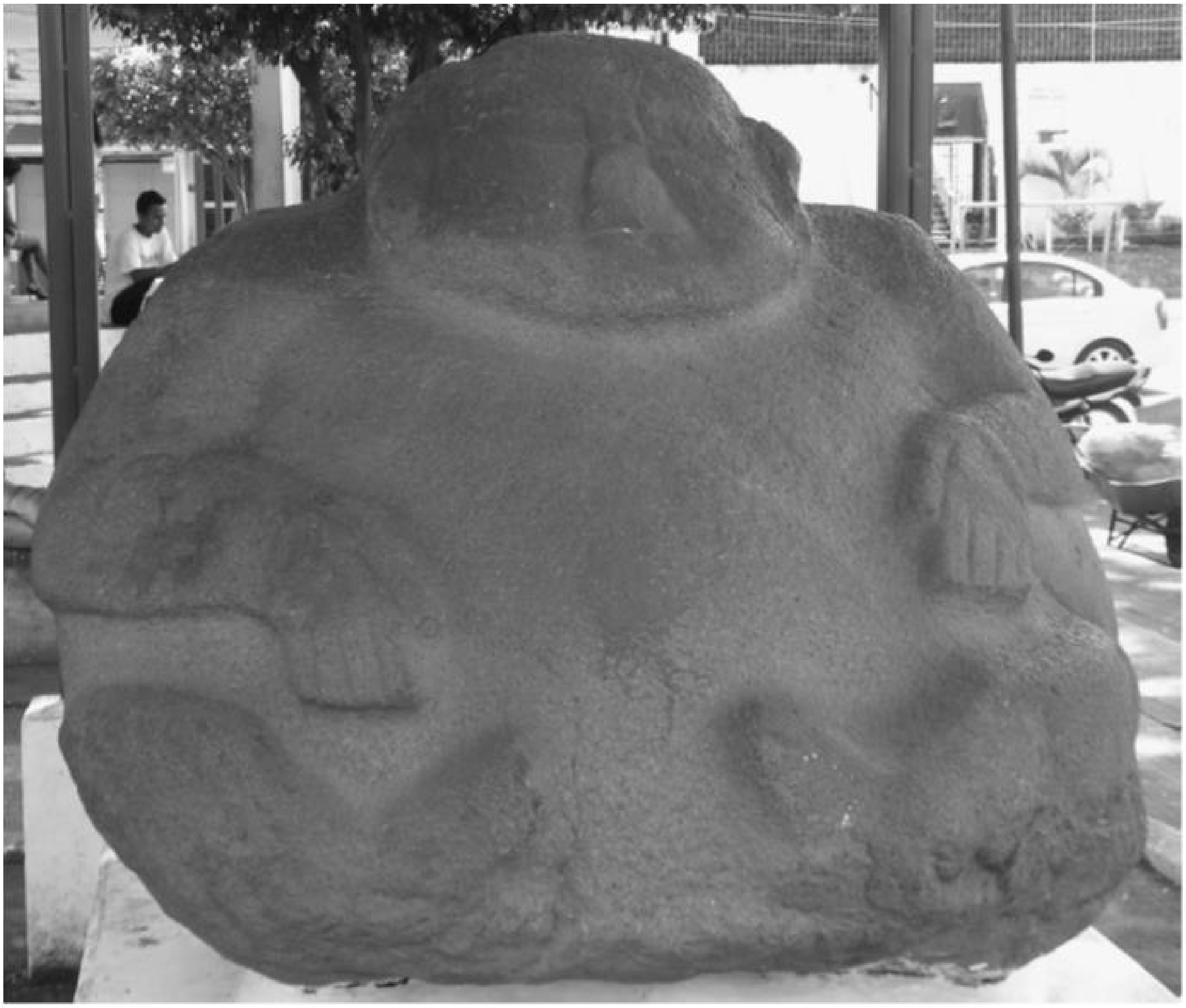


Figure 3.16 Barrigone monument from Monte Alto (Guernsey 2010:222)

I suggest here that the barrigones of the Maya area may be a local equivalent to the Olmec-style engorged baby, a "sculpture" of ceramic which has been found across the Gulf Coast, and extending into Oaxaca and Central Mexico (Figure 3.17) (Blomster 1998). These hollow-babies were produced most frequently in areas where the acquisition of boulders would be much more challenging than in the limestone karst environment of the barrigone sculpture area. Again, this may be taken as evidence of broader pan-Mesoamerican traditions that emerge during the Formative period, and the localized modes of adaptation of these motifs, constrained by social system and environmental variables in given spaces.

Figure 3.17 Olmec Baby Figurine from Dallas Art Museum (J. Dobereiner)

3.2.4 Late Preclassic Maya Kings and Olmec Motifs

New discoveries in the last two decades have transformed our understanding of Maya political systems, and further pushed back the date for the emergence of *ajaw*-style kingship. Late Preclassic writing, murals, and royal tombs discovered at sites such as Blue Creek, Chan Chich, Ko' and San Bartolo have confirmed Freidel's assertion that this institution emerged well before the epigraphically attested dynasties of the Classic period (Anderson 2011; Estrada-Belli 2011; Freidel and Schele 1988; Guderjan 2000; Houk, et al. 2010; Saturno 2009). This in turn has improved our understanding of Classic period institutions, and their crucial relationship with traditions established during the Preclassic. The importance of these institutions can be seen in the ascendance of the centers like Kamianljuyu in the Maya Highlands, and El Mirador in the Maya Lowlands, and their possible growth into regional states (Chase, et al. 2009; Ringle 1999). Yet, while some of these discoveries push back the date on the Maya area being a unique entity as early as the Late Preclassic, others tie it even more intimately to the Gulf Coast and cross-regional traditions.

Evidence for kingship in the Maya area only becomes abundant during the Late Preclassic period (Freidel and Schele 1988; Guderjan 2000; Houk, et al. 2010; Skidmore 2011). Many of the ways by which it is instantiated, however, build literally or figuratively on Olmec innovations. Perhaps no object more clearly encapsulates these intimate ties than the Dumbarton Oaks pectoral, an object of "cultural jade" which was originally carved by the Olmec into a were-jaguar headband (

Figure 3.18). The object would have been a key piece of shamanistic performance by rulers at sites like La Venta (Coe and Thacher 1966). Hundreds of years later, this piece was curated as an heirloom object by a Preclassic Maya community likely in Yucatán or Belize. The back was incised by (or for) a Maya king, and shows a new way of ruling: not with shamanistic ritual, but with writing, kingly comportment in the form of the maize god, and control of time (Rice 2008; Taube 2004b:84). Other similar jade objects of Gulf Coast geographic origin have been found in the Maya Lowlands, and similarly, Maya area ceramics have been found at major Gulf Coast centers like La Venta (Andrews 1986). Notions or rulership articulated clearly with this class of precious objects, and even when produced in localized forms, there was mutual intelligibility of how the connection between these objects and rulership may have worked (Freidel and Schele 1988:552).

Figure 3.18 Dumbarton Oaks Pectoral (J. Dobereiner)

Building on work by Freidel (1979) and others, a recent influential discovery on this took place at San Bartolo, Petén, Guatemala (Saturno, et al. 2005:5). San Bartolo is a 40 hectare site within the traditionally defined Southern Maya Lowlands. Extensive mapping has documented more than 100 mounds in the site, and the tallest structure, the Las Pinturas pyramid is 35 meters tall. A series of intact Preclassic murals within the penultimate phase of Las Pinturas depict aspects of the Popol Vuh creation myth and scaffolds, coronations, and jaguar-pelts associated with *ajaw* style divine kingship. These narratives of rulership and ritual were related strongly to the Maya maize god - a personage who is explicitly depicted with the tabular erect cranial deformation in the mode of the maize stalk, an intentional reference to a form directly associated with the Olmec (Figure 3.19) (Saturno, et al. 2005:25; Tiesler 2010).

Figure 3.19 Late Preclassic personage at San Bartolo being crowned ajaw in visage of Maize God (J. Dobereiner)

3.3 The Middle Usumacinta River Valley: Preclassic Frontier?

While not much work has been dedicated to the Preclassic of the Middle Usumacinta River Valley, several lines of evidence have prompted debate about its role as more than a uniform part of the Maya Lowland cultural sphere. This region was positioned on the far western periphery of the above-defined Preclassic Maya Lowlands, and straddled north-south and east-west exchange corridors which may have facilitated interaction across Southern Mesoamerica (Lowe 1991; Rands 2007). The region's history of research has been driven by a culture historical approach that treats its neighbors to East and West as well established Maya and Olmec cultural heartlands, even in those region's earliest periods. Scholars have analyzed Preclassic Usumacinta material culture in an effort to outline its role as a cultural frontier between these emergent Maya and Olmec cultures, or alternatively, Mayan and Mixe-Zoquean language families (Andrews 1990; Bravo 2013:14-16; Lowe 1991; Ochoa 1983; Scherer and Golden 2009). However, given the above described complications in treating the Maya and Olmec regions as bounded cultural spaces with internal uniformity, a borderland-narrative fails to capture the complications of the region, or situate it within its full anthropological setting.

Rancho Búfalo is located between Piedras Negras and Palenque, Chiapas, 15 km from the Usumacinta River which demarcates large portions of the modern border between Guatemala and Mexico. The site was well positioned at the crossroads of the Usumacinta River's overland transit corridor, and several East-West passes through the Lacandon Mountain range, giving its residents access to a series of routes that were used for movement between the Pacific Coast, Guatemalan Lowlands, and Gulf Coast (Aliphat 1994; Navarrete 1978). The routes enabled foreign traders and local elites to pass through and beyond the Usumacinta, exposing this region to powerful theological and political traditions with non-local origin. Having introduced the surrounding regions in broad strokes already, I conclude this chapter by describing the Preclassic archaeology so far performed around the Usumacinta, and contextualizing the region as representative of diverse cultural influences and instances of local negotiation across Mesoamerica.

3.3.1 Monuments in “Olmec Style” from the Usumacinta Region

Three monuments in the early Mesoamerican Olmec style have been found in the Middle Usumacinta region, at Tenosique, Tabasco, Balancan, Tabasco and Xoc, Chiapas, respectively (Ekholm-Miller 1973; García Moll 1979; Ochoa Salas and Ivon Hernández 1977; Rands 2007; Englehardt 2010) They are the westernmost monumental examples of this Olmec style, directly on the boundary of the traditionally monument-scarce Preclassic Guatemalan Lowlands (Stuart 2010). In context, alongside portable Olmec-style objects found in eastern Chiapas, the Xoc, El Mirador, and Tenosique carvings have been used as a primary line of evident to suggest the Usumacinta region had a relationship with the Olmec during the Middle Preclassic Monuments in “Olmec Style” from the Usumacinta Region. (Figure 3.21). (García Moll 1979; Palacios 1928:98; Stirling 1957; Stuart 2010:24).

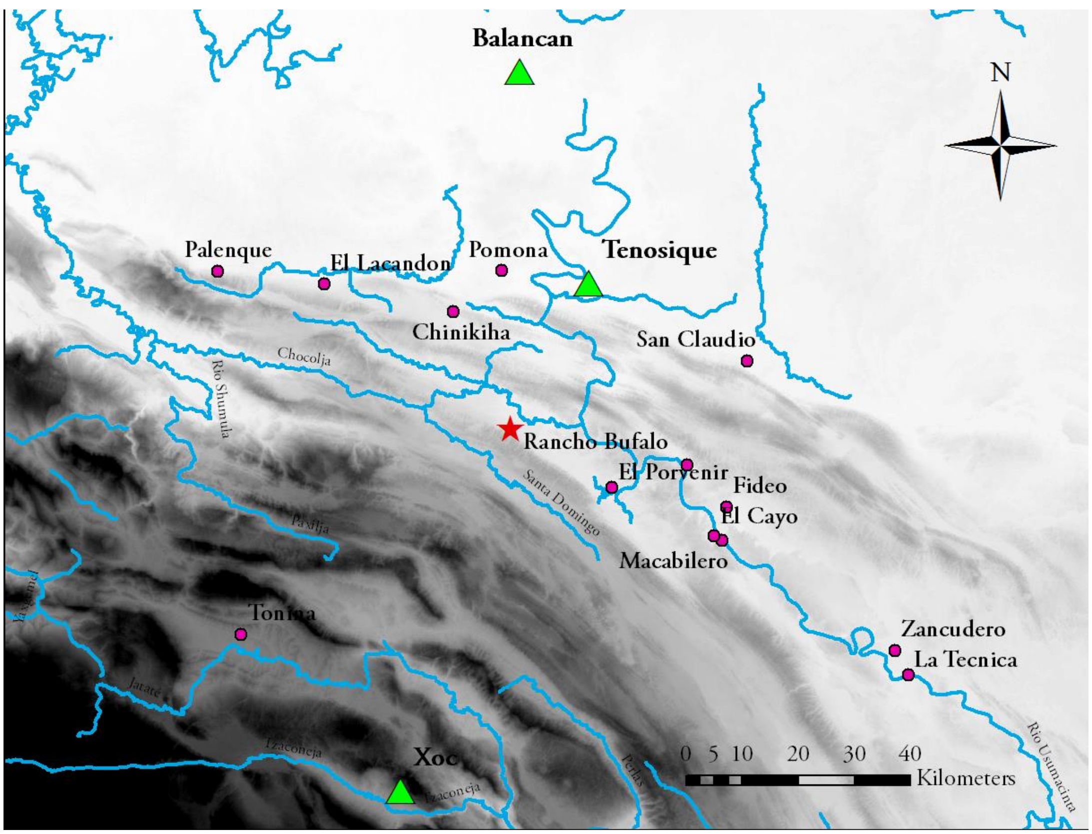


Figure 3.20 Map showing locations of Olmec-style carvings from Usumacinta region: Xoc, Balancan, and Tenosique (J. Dobereiner)

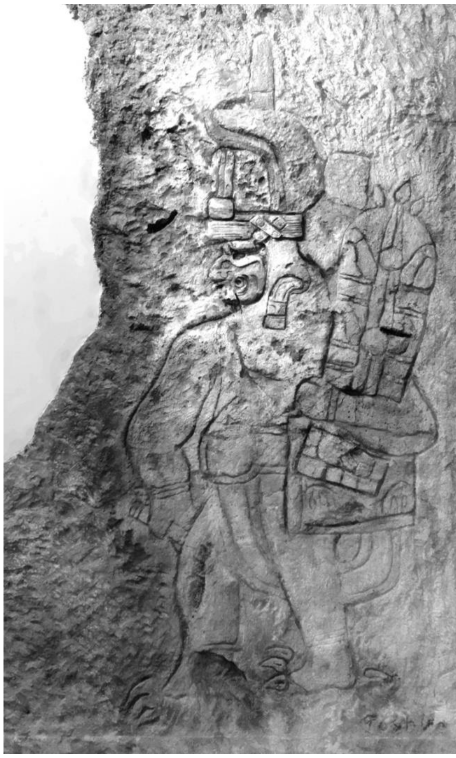
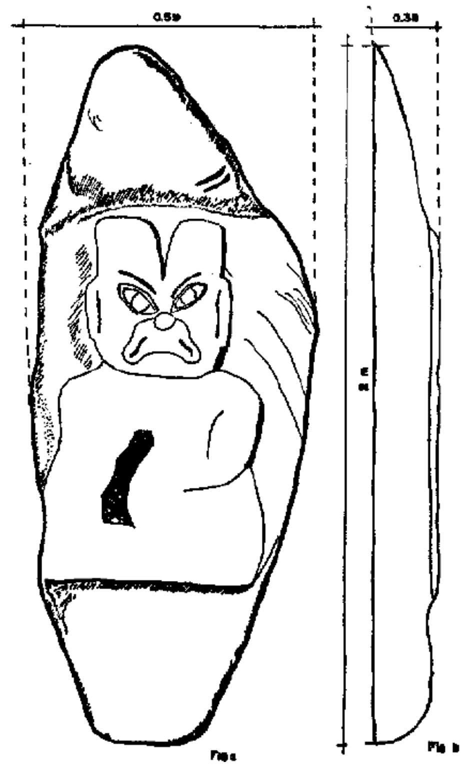
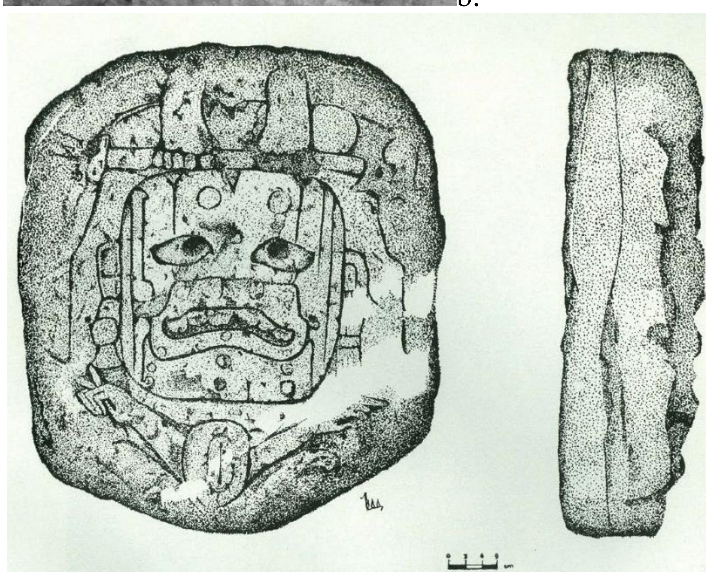
a. 
b. 
c. 

Figure 3.21 Olmec-style carvings from Usumacinta region: (a) Xoc (J. Dobereiner) (b) Balancan (Ochoa Salas and Ivon Hernandez 1977:83) (c) Tenosique (Garcia Moll 1979:56)

Xoc was a small center located 65 km south of Rancho Búfalo, on the Jatate River, Chiapas, north of the community of Independencía, Mexico. The site contained a two meter rock carving of a figure with clear Olmec characteristics (Ekholm-Miller 1973:9). It had been believed to have been destroyed by looters until it was re-discovered in France in 2015 and formally return to Mexico (INAH-Boletin 2015). While no contemporaneous ceramics were recovered, the sculptural style, headdress and presence of crossed-band, maize, and water motifs place the carving within the low-relief tradition known from the La Venta period Olmec, an attribution that would make it one of the earliest relief sculptures in what became the Maya area (Ekholm-Miller 1973:23; Stuart 2010:286).

An Olmec-style stela and several Olmec-style pieces of portable material culture, including a figurally carved greenstone adze and a series of figurine heads, were found in the area of Balancán, Tabasco, within the communities of El Mirador and Emiliano Zapata, 60 km north of Rancho Búfalo (Ochoa Salas and Ivon Hernández 1977). These pieces were not recovered in-situ, though the stela is believed to have originated in the immediate area surrounding El Mirador. This limestone block is approximately 2 meters tall by 89 cm wide, and contains a low-relief carving of a personage, with a characteristic Olmec-style features including deep "V" in the forehead and feline eyes (Ochoa Salas and Ivon Hernández 1977:82). Most of the features below the head were eroded, making it impossible to ascertain the nature of the body's position. An Olmec stylistic attribution can still be made based, among other elements, on the form of the figure's head (Ochoa Salas and Ivon Hernández 1977:84).

A third Olmec-style monument was found and documented 40 km northwest of Rancho Búfalo, in a modern community also named Emiliano Zapata, Tabasco, located southeast of Tenosique, Tabasco (García Moll 1979:55). Several mounds were also documented in the community, though no excavations were performed, and the precise archaeological context was not ascertained. This limestone block measured 94 cm by 88 cm, and had low relief carving on one side. The carving is of an Olmec-style feline deity face, with a deep "V" across the forehead, large eyes, and were-jaguar fangs (García Moll 1979:56). Though the head dominated the composition, a small body and limbs are also represented underneath it. It has been compared to monument 27 from Laguna de los Cerros, Veracruz and other Veracruz sculptures (García Moll 1979:57).

3.3.2 Evidence of Cultural Connectivity in Preclassic Usumacinta Ceramics

These sculptures are complemented by portable material culture and mixed-context ceramic from sites in the Middle Usumacinta River Valley, which show influences that extend beyond standard Preclassic Maya typologies (Ekholm-Miller 1973; Englehardt 2010; García Moll 1979; Ochoa Salas and Ivon Hernández 1977; Rands 2007). Maya-style ceramic have been found at Olmec sites including La Venta, further emphasizing the extent of Preclassic Interregional exchange that may have traversed the Usumacinta region (Andrews 1986). Arguments for Olmec influence in the Usumacinta Region have in particular been based on analysis of early ceramics (Bravo 2005; Englehardt 2010; Rands 1969).

So far, most knowledge of the Preclassic Usumacinta's ceramic has depended on the seriation of small amounts of early sherds recovered from secondary contexts in the course of Classic Period excavations (Bravo 2005). Such Classic Period fill layers from Palenque and five nearby sites in Chiapas and Tabasco provided sherds from which Robert Rands was able to generate a Preclassic ceramic chronology of the Palenque region (Rands 1969, 2007). While limited by the lack of contextual data, he noted that the diverse influences in the material - a notion that can now be confirmed with firmly stratified material contexts from Rancho Búfalo Work on this material led him to suggest that the region's Middle Preclassic ceramics would be "...more at home on the fringes of the Maya area or outside it than within the Maya lowlands"

(Rands 2007:33). This same dataset was later revisited to explore broader ethnic affiliation in the Late Preclassic and Early Classic (Englehardt 2010).

While these ceramics were largely found in secondary contexts that contained large quantities of Classic period remains, limited amounts of Preclassic Usumacinta ceramics in primary contexts have also been recovered from Piedras Negras, La Técnica and Fideo, Guatemala, and at El Lacandon, Chiapas (Arroyave, et al. 2009; Bravo 2013; Escobedo and Houston 2001:530; Muñoz 2004; Pérez Robles 2006). A small Preclassic settlement core found at Piedras Negras yielded approximately 350 diagnostic Middle Preclassic sherds (Escobedo and Houston 2001:530; Muñoz 2004). Forsyth's ceramic analysis in the 1997 Piedras Negras informe analyzed sherds from the South Plaza and Patio indicates a robust Chicanel and Mamom-like phase Preclassic occupation, and general similarities to documented Lowland Maya traditions (Forsyth and Hruby 1997:208). From 2007-2009 the Proyecto Regional Arqueologico Sierra del Lacandon (PRASL) project dug test pits in the Late Preclassic to Early Classic sites La Tecnica and El Fideo, Guatemala (Arroyave, et al. 2009). Recent work at El Lacandon, Chiapas has also revealed an extensive Late Preclassic settlement near to Palenque (Bravo 2013). My work in Rancho Búfalo greatly increases the amount of primary ceramic data known from the Usumacinta region, and this is analyzed in Chapter 5.

3.4 A New Approach to Preclassic Mesoamerican Culture Contact

The nature of Mesoamerican social complexity changed dramatically from the Middle Preclassic through to the Classic period. Established archaeological sequences from the west among the Mixe-Zoques of Chiapas and Tabasco and east into the Maya lowlands indicate that their ceramic styles, architectural design and preferred obsidian sources diverged through the

Preclassic (Clark and Hansen 2001; Forsyth 1999; Grove 1993). In the Protoclassic, a process of Mayanization began in which sites with Mayan hieroglyphic writing spread throughout Chiapas and Western Tabasco. By 900 AD, a firm ethno-linguistic frontier was established with Mixe-Zoque speakers that persisted through the Spanish Conquest and into the present day (Longacre 1967; Martin and Grube 2000). This Mayanization has possible analogs among the Southeastern Maya in areas like the El Paraíso Valley of Honduras. In that case, Lenca and Maya groups likely developed a cultural paradigm of mutually intelligibility by connecting through broader cultural currents of Southern Mesoamerica (Canuto and Fash 2003:57). My research at Rancho Búfalo provides an additional line of evidence to explore the rise and fall of connectivity between the Maya and Olmec areas, and deconstruct their supposed boundedness.

Extant work in the liminal spaces between the traditionally defined Olmec and Maya cultural heartlands of the Preclassic have largely focused south along the Pacific Coast (Navarrete 1978; Rosenswig 2010). Much of this research draws upon comparative art-historical work with stone monuments, which are infrequently found in large swaths of the Preclassic Lowlands, limiting available inter-regional comparisons (Guernsey, et al. 2010; Parsons 1986). Routes known from the Classic and Colonial periods that follow the Usumacinta, its tributaries, and the passable valleys surrounding it would have complemented these better understood coastal routes of interaction (Guernsey, et al. 2010; Navarrete 1978; Parsons 1986). It is in this context that sites like Rancho Búfalo are especially important.

In architecture, ceramics, ritual practices, and exchange goods, the residents of Rancho Búfalo made local responses to an emergent global tradition of the Mesoamerican "world civilization." While the resulting material assemblage was unique, given the heterogeneity within essentialized heartlands of the Maya and Olmec, this uniqueness was not unique. Each region, and each center within Preclassic Mesoamerica had similarly diverse responses. The traditional approaches to Preclassic research that have divided Mesoamerica into cultural territories like "Maya," "Olmec," "Zapotec" or "Central Mexican" at this early phase fall short of accurately describing the complex spread of Mesoamerican traits during the earliest phases of emergent social complexity. This framework treats cultural diversity in spaces located between these essentialized cultural groups as borderland contexts, as has been applied usefully in global anthropology to understand culture contact and overall social trajectories (Parker 2006). This would make Rancho Búfalo's culture historical significance its role as a borderland site between the Olmec and Maya cultural heartlands. But it is more usefully approached as a site that was geographically peripheral from the majority of "large" coeval centers, at which residents were able to make local interpretations of expanding global traditions of Mesoamerican-ness.

However, given the tremendous heterogeneity in supposedly integrated cultural territories of the Preclassic Maya and Olmec, I propose this paradigm of local interpretations can be usefully applied to most Formative sites, not just those like Rancho Búfalo. These center's individual trajectories can be understood as a series of local responses to an emergent Mesoamerican tradition that cross-cut the supposed boundaries between and within these cultural territories. The divisions varied across material traditions, with architecture and ceramics described here, and similar non-uniformity in burial assemblages and spheres of obsidian acquisition. It is too simple to look to sites like Rancho Búfalo on the Western Frontier of what has been traditionally been called the Preclassic Maya area, and assume a borderland context existed in opposition to the Olmec.

Rather than projecting back in time the better understood cultural categories developed in the Classic Period, I question the notion of an integrated Maya territory in the Middle Preclassic, a time where no texts can be read, and sites were extremely diverse. By employing this approach, I am able to interpret my work at Rancho Búfalo as a site within a *culturally incorporative* territory. Further, challenging entrenched conceptions of these cultural territories allow a more accurate integration of contemporary anthropological deconstructions of identity, boundaries and borders, and allows work at Rancho Búfalo to contribute meaningfully to decoding the fractured, dynamic, and exciting landscape of formative Mesoamerican complex society.

CHAPTER 4 - BUILDING COMMUNITY: RANCHO BÚFALO'S HYBRIDIZED MIDDLE FORMATIVE CHIAPAS PLAN AND THE LATE PRECLASSIC USUMACINTA CONFEDERATION

At Rancho Búfalo, architecture and the built environment constitute the most archaeologically accessible forum in which discourses surrounding the emergent Mesoamerican world civilization played out. Further, as a Preclassic site with little Classic period occupation overlying its early architecture, Rancho Búfalo provides a comparatively accessible opportunity to test hypotheses surrounding the nature of early built environments in the Usumacinta River Corridor, which I argue is a "soft boundary," as opposed to the traditionally firm divide articulated between the "Olmec" and "Maya" heartlands. The site's location on the routes that connect regions traditionally classified as these culture's "cores," allows my analysis to contribute directly to understanding the role of localism in built environments in the spread of the Middle Preclassic Mesoamerican cultural horizon.

Public architecture at Rancho Búfalo can also be used to study the articulation between local cultural traditions and an increasingly *politically* interconnected world, entering the Late Preclassic. Changes in Rancho Búfalo's site plan through time reveal how local residents integrated parochial and external material traditions in an effort to enhance global connectivity while maintaining autochthonous identity. While trends encapsulated by the increasingly homogenized Mesoamerican world civilization were accommodated partially, hybrid architectural plans and collaboration between Middle-Usumacinta sites allowed Rancho Búfalo's residents to maintain their unique cultural system in the face of extra local political influences of emergent powerful centers like El Mirador.

These changes resulted in at least two discernable phases of architectural adaptation at Rancho Búfalo: a Middle Preclassic site-specific phase (600 - 400 BC), and a Late Preclassic regional phase (400 BC - AD 250) involving interaction and co-dependence of centers from throughout the Middle Usumacinta River Valley. During the Middle Preclassic, extra-local forces acting upon Rancho Búfalo's residents were of a less-politically connected form as the Mesoamerican "world civilization." As explored in Chapter 3, the precocious archaeological cultures from this period relied on divergent site plans that cross cut supposed divisions between the Olmec and Maya area. Site designations like the Middle Formative Chiapas Plan (MFC), and those established at Nakbe, Guatemala during the early phases of Maya kingship (Clark and Hansen 2001) underemphasize the substantial heterogeneity within and across these boundaries. However, increasingly populated areas along the Gulf Coast and in the Southern Lowlands had a growing ability to influence interregional networks of goods and materials which were important to rulership in Preclassic Southern Mesoamerica. Elites of Rancho Búfalo adopted architectural traits that, in part, were likely designed to ensure continued inclusion in these networks, while maintaining important local traditions.

Entering the more populated and increasingly politically centralized Late Preclassic (400 BC - AD 250) Rancho Búfalo was one member in a series of small centers along the Middle Usumacinta River Valley (Golden 2013). At this time, massive central places arose in the Maya Lowlands and Pacific Coast that contained the full complement of ceremonial structures that embodied Late Preclassic rulership: E-Groups, triadic groups, and ballcourts (Chase and Chase 2012:258; Love 2011a). No similar "full service ritual center" arose in the Middle Usumacinta; instead, individual site centers built complementary individual ceremonial structures (Golden 2013). This confederated set of small centers was thus drawn together into a larger, geographically dispersed, community, an approach that granted greater autonomy, and stood in contrast to the agglomerations into single ruling centers that was occurring in Petén and the Southern Maya Area. Through the use of complementary ceremonial architecture and shared public events, Middle Usumacinta centers forged an active community and employed this novel form of distributed urban planning to draw their settlements together into a single political collective (Anderson 2006; Canuto and Yaeger 2000). Through this means, Usumacinta centers were able to maintain a unique cultural style which persisted into the Classic period (Golden and Scherer 2013).

Rancho Búfalo's unique interpretation of the Middle Formative Chiapas plan, and its participation in a confederated-center approach to Late Preclassic urbanism, are examples of hybrid approaches to community maintenance. Rather than wholesale adoption of architectural systems from neighboring areas, these frontier residents modified their architectural plans to ensure continuity of their local Usumacinta identity, while allowing continued participation in changing sociopolitical regimes. The ways these sites' plans changed through time demonstrate how public architecture in the middle Usumacinta River Valley was developed and hybridized in a context of broader sociopolitical shifts across Southern Mesoamerica. The intimate and ongoing ties between the built environment and cultural negotiation at Rancho Búfalo mirror cross-cultural examples from other contexts of anthropological study. Their analysis offers a unique perspective on how material culture can articulate with community development on the margins of emergent complex societies in the Pre-Columbian world and beyond (Frachetti 2012).

4.1 The Social Role of Built Environments in Early Complex Societies

Centralized projects that rely on cross-class participation are a hallmark of complex societies around the world (Burger and Rosenswig 2012; Trigger 1990:326). While public constructions always rely on group labor and broader community engagement, the design of public spaces is often controlled by aspiring leaders with a vested interest in bringing people together (Lawrence and Low 1990). Inducing diverse groups to invest in these collective, monumental projects could serve as a founding event to forge a new community. As Pauketat describes the articulation between architecture and the founding of Cahokia: "The mound builders probably came from many different backgrounds, with at least as many different understandings of what earthen construction meant. So the mounds were not simply *reflections* of political institutions as they were. Mounds and mound building were institutions *coming into being*" (2007:42).

Understanding the choices made by elites in designing central ceremonial places is especially important because of the intimate ties between the spectacle that took place in these locations and early community development (Inomata 2006; Wheatley 1969). In times of nascent authority, these events were the central duties of site elites; "mass ritual was not a device to shore up the state, but rather the state…was a device for the enactment of mass ritual. Power served pomp, not pomp power" (Geertz 1980:12). Articulating with this connection to spectacle is that early public architecture would have represented the largest human-built structures hunter-gatherers or insipient agriculturalists would ever have seen (Trigger 1990). This made them critical tools in nascent community building, as elites worked to attract interest in their own ritual systems, and retain early sets of mobile peoples with a strong ability to "vote with their feet" (Hayden 1996:50).

Through both the production of monumental architecture and the events that took place in these settings, it became possible to instantiate unified ethnic, religious, and sociopolitical beliefs across a broad population (Demarest 1992; Geertz 1980:12; Inomata 2006; Watkins 2006; Wheatley 1969). In addition to religious symbolism, ethnic and community signaling are encoded in site design (Hodder 1982). These ceremonial connections would complement and further enable elite use of architecture and monumentality to develop communal power and institutionalize local social hierarchies (Burger and Rosenswig 2012; Joyce 2004; Trigger 1990:326). The modification, design and production of these public spaces would then have a transformative impact on the emergence and stability of nascent communities, often with consequences unintended even by political leaders and community members who initially conceived them (Hayden 1996; Joyce 2004; Lawrence and Low 1990; Pauketat 2007).

In Mesoamerica, the architecture for world-centering and ethnic signaling has been demonstrated in ceremonial *tollan* centers of Central Mexico such as Teotihuacan and Tenochtitlán, and is increasing documented in communities throughout Mesoamerica (Carrasco, et al. 2000:13; Fash and López Luján 2009; Kowalski 1999; Lujan and Austin 2009; Moctezuma 1999; Tate 1992). These buildings built upon deep-time religious beliefs related to the sacred nature of caves and mountains, and aggregators used these ideas to their own advantage (Brady 2000; Stuart 1997; Taube 2004a). Site founders drew upon and developed the concept of the sacred "flower-mountain" and its tie to world origin and fertility, by constructing anthropogenic examples of this natural phenomenon (Cohodas 1980; Saturno, et al. 2005; Taube 2004a). In studying the Maya, the construction history of early public structures offers a window into decision making among elites, and the first instrumental choices they made to generate integrated communities and maintain their position (Abrams 1994; Estrada-Belli 2011; Saturno 2009).

There is particular value in studying these processes in a Middle Preclassic geographic periphery like Rancho Búfalo. The elite introduction or hybridization of non-local architecture may reflect a signal designed for extra-local dignitaries, but their construction may have been constrained by the local population's desire to maintain standing traditions (Smith 2003b). A useful Mesoamerican analogy involving sociopolitical incorporation is the Early Classic Paraíso Valley of Honduras, where communities on the threshold of emergent Maya states responded with unique local traditions of power (Canuto and Fash 2003). Communities in the Paraíso Valley experienced direct political incorporation attempts by the emerging Maya secondary state at Copán, leading to contrasting communities like Las Achiotes and El Raizal, located 20 km east of Copán, and only a few km from one another (Canuto and Bell 2013). While Preclassic and Protoclassic Las Achiotes enacted authority through continuing local Lenca traditions of familial inclusiveness, Early Classic El Raizal acted as an apparatus for the emergent Maya bureaucracy and supplanted these traditions (Canuto 2004:35). This case study from the eastern limits of the Maya area are informative to work at Preclassic Rancho Búfalo, and offer a comparative case of direct political coercion to contrast with the passive cultural incorporation into the Mesoamerican "world civilization" which took place within the Middle Preclassic Usumacinta region.

Despite global interest in the relationships between organizations of architectural space and early social hierarchies, burial and destruction of archaeological sites by later occupations present consistent challenges to locating and interpreting early built environments (Cowgill 2004; Postgate 1994; Thorp 1991; Ur, et al. 2007). The Maya are no exception; Preclassic settlements often lie deep beneath millennia of later structures, plazas, and fill (Estrada-Belli 2006; Inomata, et al. 2015; Inomata, et al. 2013). When the construction history of public structures is recovered, it offers a window into instrumental choices made by elites to integrate early communities, and the nascent Mesoamerican belief systems that became foundational to later phases (Abrams 1994; Estrada-Belli 2011; López Austin and López Lujan 2000; Saturno 2009).

4.2 Interpreting Middle Preclassic Rancho Búfalo with the Middle Formative Chiapas Pattern

As explored in Chapter 3, the spread of the Middle Formative Chiapas (MFC) architectural plan has been used in part to circumscribe the Olmec area, and suggest their primacy in the emergence of Mesoamerican civilization (Clark and Hansen 2001). The site plan contains, as described by Clark and Hansen: “a north-to-south axial arrangement of regularly spaced pyramidal platforms and plazas. The tallest platform or pyramid is located to the north, and in the south is a paired arrangement of a long, low mound flanked on the west by a tall pyramid. This latter arrangement has long been known as an "E-Group" in Maya studies.” In addition they note a large acropolis east of the central which may be “the location of a royal compound or precinct” (2001:4). At La Venta in particular, there is a special precinct to the north of the C-1 Pyramid. “This unique area of special offerings distinguishes La Venta from all the contemporaneous Chiapas centers and probably signaled conceptual differences sacred status to the people themselves” (2001:5).

While Clark and Hansen (2001) trace the origins of the MFC to La Venta, recent scholarship has complicated unilineal models for this site plan from a central location on the Gulf Coast. Possible finds of coeval or earlier constructions east of the Grijalva River in the Preclassic Maya area have made it untenable to suggest a purely Olmec genesis of this site plan

(Estrada-Belli 2011). Further, research on structure D-1 and D-5 at La Venta have raised questions about whether this be classified as a Maya-style E-Group at all (González Lauck and Courtès 2013). Excavations within this zone have revealed it was constructed in a single occupation phase, and was a secondary structural complex to the broader La Venta site plan (Gonzalez Lauck, personal communication). Instead of representing a crystallized architectural package that originated at La Venta, MFC structures were shared and developed inter-regionally – and may have spread individually, not as a crystallized package (Inomata, et al. 2013:470).

Further deconstruction of a uniform MFC is based on the varying alignment of E-Groups and their surrounding centers. While the orientation at La Venta is eight degrees west of north, there is substantial variability from this orientation among Middle Preclassic site complexes (Blake 2013; Sullivan 2009). This alignment divergence cone may be based on surrounding landscape features, and localized sub-regions within the area of MFC influence (Blake 2013). Uniform orientations across centers may indicate broader affinities within a specific political sub-group.

I build on these developments by exploring the design and spread of individual structures and features connected with this architectural complex, instead of seeing it as a unified architectural "package." This enables a nuanced approach to Rancho Búfalo, a site located in a space between the traditionally defined Olmec and Maya cultural areas (Lowe 1991; Rands 2007). By separating out individual structures, it becomes possible to explore how architecture and identity articulated in geographically peripheral areas of Preclassic Southern Mesoamerica without preconceived notions as to how it may fit into traditional developmental narratives.

4.2.1 Rancho Búfalo Site Plan

The ceremonial core of Rancho Búfalo occupied approximately five hectares, and was bounded on three sides by shallow streams (Figure 4.1). Directly opposite highway 307 on the south of the site is a large slow-moving body of water; before the highway's construction in the 1990's, this may have been a stream as well, which would make the core of the site an "island" of-sorts. Relative ceramic chronology suggests Rancho Búfalo was occupied from approximately 600 BC to AD 250, with a limited and intermittent reoccupations during the Classic period, as discussed further in Chapter 5. All structures at the site have a thirty degree east-of-north orientation that was maintained through all known occupation phases and is in line with later Usumacinta examples such as Piedras Negras (Escobedo and Houston 2001; Golden, et al. 2008; Scherer:190-195). Individual structure heights do not exceed four meters, and most are between one half and two meters.

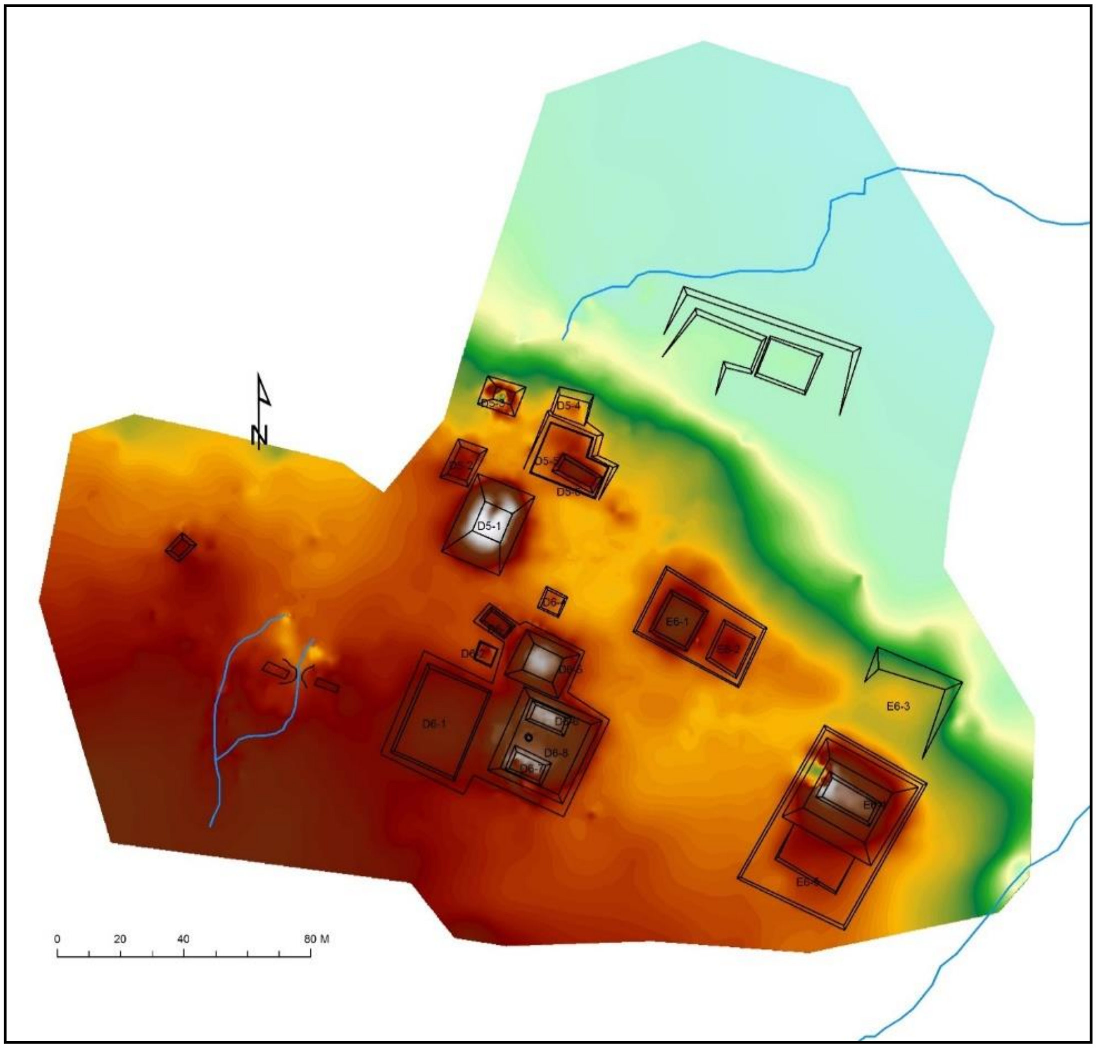


Figure 4.1 Structures, Water Features and Topography of Rancho Búfalo, Chiapas, México, 2013 (J. Dobereiner, B. Davenport, C. Golden)

Despite its relatively small size, the ceremonial core of Rancho Búfalo has a complex and heterogeneous architectural plan evocative of larger sites of the Gulf Coast, Grijalva River Valley and Maya Lowlands. It contains several hallmarks of early complex centers of Southern Mesoamerica, including a wide platform with a twinned, ballcourt-like, superstructure (D6-8) and a site pyramid (D5-1). This architecture, alongside another ten mounds and low platforms, delimit three different sized plaza areas, the northernmost representing a possible ceremonial precinct.

Though Rancho Búfalo contains Middle Preclassic architectural features documented at other sites, it also has several unique features. One of the most significant differences is the lack of a solsticially aligned an E-group complex (Aimers and Rice 2006; Doyle 2012; Guderjan 2006). These are considered central to MFC site plans, and a primate structure in early aggregative settlements across Middle Preclassic Mesoamerica (Doyle 2012; Inomata, et al. 2013). In the greater Preclassic Usumacinta area, however, E-Groups are comparatively rare (Rice 2015:13). Only La Técnica has a canonical E-group, and given its north-south site orientation, their Preclassic community may represent an intrusive population (Figure 4.4).

The earliest major public structure at Rancho Búfalo is located on what became the eastern limit of the site's ceremonial core (E6-4). The community may have first settled around the use and construction of this earthen platform, which went on to be used throughout the site's occupation history. After it was built, residents at Rancho Búfalo begin to adopt architectural features associated with the MFC settlement plan. Even when they did, these new structures served complementary roles and did not diminish use and new building phases of E6-4. While MFC-associated structures were introduced, they were not built in the manner seen at other sites, and an E-Group was never constructed. This may reflect the particularities of material influence at Ranch Búfalo, due to its geographic location between, and peripheral to, the traditionally defined Olmec and Maya heartlands. The design of the ritual center suggests the presence of an tenuous elite confronting tensions between local conservatism for autochthonous traditions and global currents that would improve their prestige through access to extra-regional networks of goods and ritual knowledge (Cobb 1996; Kipp and Schortman 1989; Porter 2004).

The overall site plan and footprint of the western portion of Rancho Búfalo, independent of the E6-4 platform, is similar to the canonical MFC pattern. The western set of structures in

Rancho Búfalo's ceremonial core were arranged directly north-south relative to one-another. While much smaller, measuring 150 meters north-south as compared to approximately 500 meters at Chiapa de Corzo, La Libertad, and Mirador, Chiapas and 1000 meters at La Venta, the form is congruent (Figure 3.4). The tallest structure at the site, D5-1, is positioned similarly to the Complex C-1 pyramid at La Venta. To the north of the site pyramid, there is a small ceremonial precinct. To the south of the site pyramid are several structures, including a large platform (D6-8) which may be evocative of the Stirling Acropolis, and is topped by a twinned super structure. The most notable difference, from the MFC as well as centers throughout the Preclassic Maya Lowlands is the absence of an E-group.

4.2.2 The Northern Ceremonial Precinct

The northernmost plaza at Rancho Búfalo is bound by several low structures, including D5-3 to the north and D5-1, the site pyramid, to the south. It would have offered limited visibility to those outside the bounded structural zone, and its plan, position to the north of the site and restricted routes of access is evocative of the northern ritual precinct at La Venta. In addition to the similarities in plan, archaeological evidence confirms that the northernmost plaza at Rancho Búfalo can be compared to La Venta Complex A, which contained a series of greenstone caches and burials, including a royal tomb (Drucker 1959). Excavations at Rancho Búfalo have revealed a similar use of this space for interments of symbolically loaded objects and individuals.

The northern precinct of Rancho Búfalo contained at least one cache with a series of seven serpentine stone celts. These were not discovered by archaeologists, but by Rancho Búfalo's modern landowners, who found them while building their home in the late 1990's.

While comparatively smaller, this group of celts of varying size is evocative of caches from ceremonial precincts of the Olmec Gulf Coast, and those in the Maya Area that are more associated with E-Group centerline caches (Drucker 1959; Estrada-Belli 2011; Inomata, et al. 2013; Reilly 1995).

Also in keeping with other known Middle Preclassic ceremonial precincts were a series of burials in the northern core of Rancho Búfalo. One was recovered and excavated intact (Burial 3). Three others were bioturbated or damaged by modern construction and were not excavated, though several partial Preclassic ceremonial vessels were recovered from surrounding contexts. In the case of structure D5-3, looting damage revealed the capstones of a tomb. In 2011 PABC project members were able to excavate it, and reveal a well-constructed burial chamber (Figure 4.2). While it had been looted in antiquity and most of the remains and goods removed, it was possible to see some portion of the remains and determine the position and nature of the internment. These burials and celts are discussed further in Chapter 6.

Figure 4.2 Tomb in structure D5-3 from Rancho Búfalo (C. Golden)

While the architecture of structure D5-3 is described later in the chapter, the presence of interred remains in this building, and the various partial burial found throughout the Northern Precinct, demonstrate a strong affinity for the traditional MFC approach to this ceremonial space. The position of this burial group in the northern precinct in an analogous position to examples from La Venta Complex A-1. Similarly, the La Venta tombs were built of earth and lined with basalt pillars, the Rancho Búfalo example had a single vertical limestone monolith at the feet of the interred individual.

4.2.3 Site Orientation

Rancho Búfalo's overall site plan places structures north-south relative to one another, in line with other known Middle Preclassic centers from the Maya and Grijalva River areas (Clark and Hansen 2001). Where Rancho Búfalo differs strongly is in the alignment of individual structures. Architectural forms throughout the site maintain an individual alignment of 30 degrees east-of-north (Figure 4.1). This includes the stone walls bounding E6-4 sub. 2, a Middle Preclassic earthen platform which is one of the earliest structures found at the site (Figure 4.3).

Figure 4.3 Early stone walls bounding E6-4 sub. 2, oriented at 30 degrees east-of-north (J. Dobereiner)

The 30 degree orientation is outside of the range of variance established by Michael Blake for MFC plans in Tabasco and Chiapas, and the Maya Lowlands (Blake 2013). In analyzing broader traditions of the Maya area, this orientation appears with great frequency in one region – the Usumacinta River Basin (Golden, et al. 2008; Scherer 2015:190-195). Classic period sites, such as Piedras Negras and Yaxchilan regularly have 30 degree orientations throughout their architecture, with cardinal deviations offset by 90 degree intervals to 120, 210 and 300 degrees respectively (Escobedo and Houston 2001; Golden, et al. 2008; Scherer 2015:190-195). Within this framework, they differ in their primary ceremonial access. For example, Late Classic centers within Yaxchilan's sphere of influence often use a 120 degree primary ceremonial axis, whereas Late Classic centers within Piedras Negras' sphere of influence often use a 30 degree primary ceremonial axis (Stuart 2009; Tate 1992).

The presence of the 30 degree alignment at Rancho Búfalo suggests that the Usumacinta regional orientation was already in place by the Middle Preclassic. Other Late Preclassic centers from this area, including Piedras Negras, Zancudero, Fideo, and the Structure 1 pyramid at El Lacandon, also share 30 and 120 degree orientations (Figure 4.4). This deeply engrained local tradition of site alignment was maintained in this region through the Preclassic and into the Classic Period, despite exposure to extra-regional traditions. This is in contrast to neighboring areas where patterns were at times adopted wholesale, overlapping or supplanting autochthonous ideals.

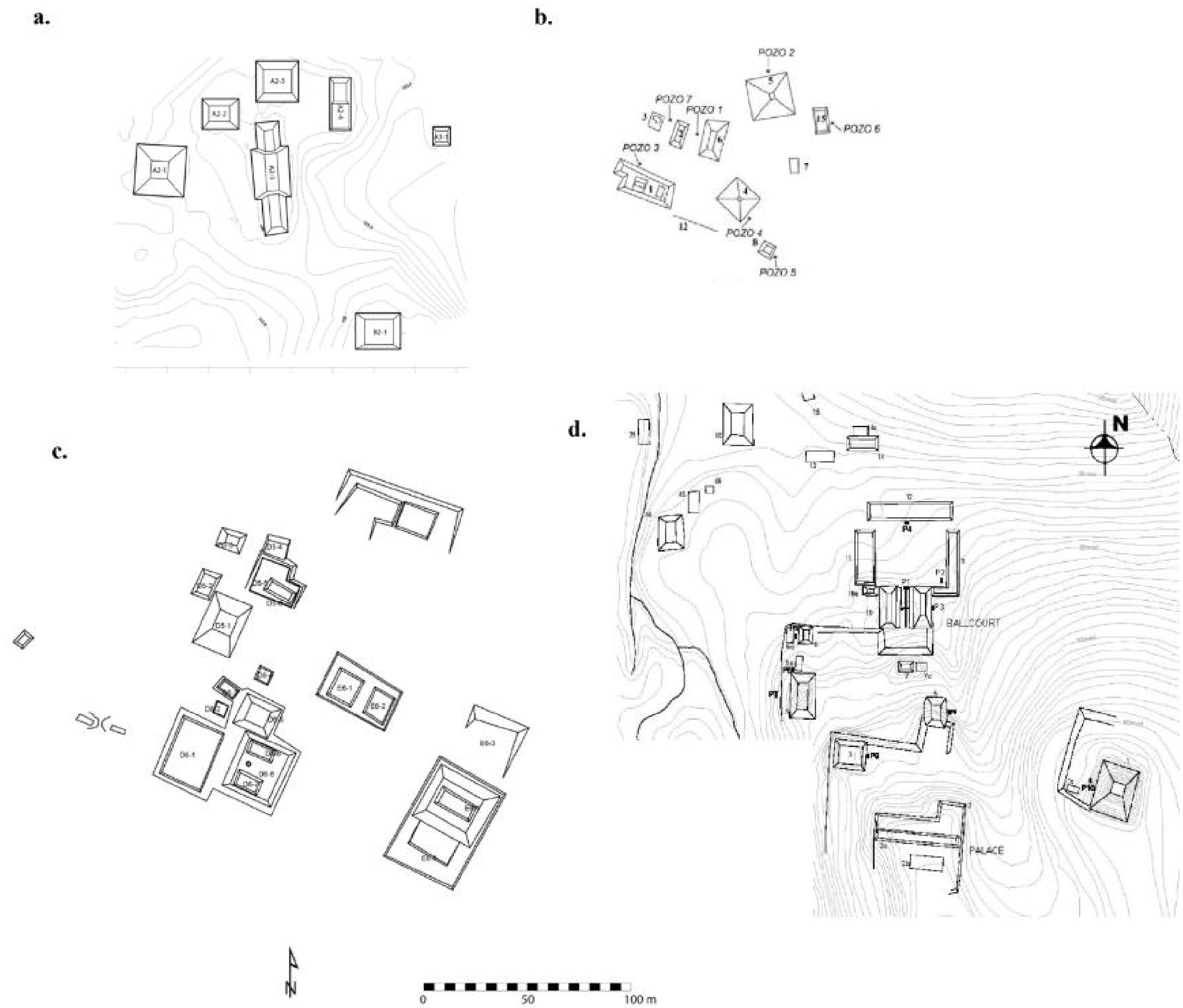


Figure 4.4 Preclassic Usumacinta site plans. (a) La Tecnica, Guatemala (C. Golden), (b) Fideo, Guatemala (C. Golden), (c) Rancho Búfalo, Chiapas (J. Dobereiner), (d) El Lacandon (R. López-Bravo)

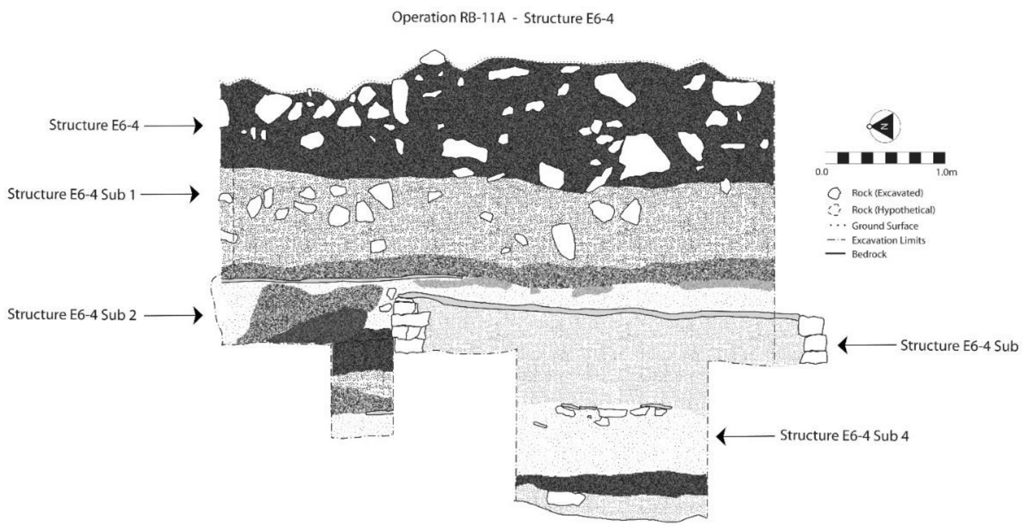
The origins of the 30 degree orientation is obscure. The sun is the key orientation device throughout Mesoamerica, and one possibility is a relationship to the 114 degree east-of-north winter solstice sunrise, and a series of 90 degree perpendicular offsets from this. The winter solstice may have been of particular importance in the Usumacinta valley, as compared to the emphasis on equinox or summer solstice events in other regions. It has also been suggested that this alignment relates to the direction of flow of the river near Yaxchilan, or a valley proximate to Piedras Negras. This builds on Blake's approach to variations within more traditional E-Group orientations, and how they may relate to geographic features near the "inaugural" center in a local group of sites (2013).

4.2.4 Eastern Mounds, and Early Site Ceremonialism

At Rancho Búfalo the large platform (E6-4) directly to the east of the main ceremonial complex was the primate aggregative public structure, as opposed to the more common use of an E-Group (Figure 4.5). Ceramic analysis and the construction techniques utilized suggest that E6-4 and its sub-platforms are among the earliest public architecture at the site. Excavations revealed a series of earthen architectural phases that demonstrate both the comparative antiquity for this structure, and that it was actively used throughout the site history.

a.

b.



c.

Figure 4.5 Looted structure E6-4, a. photograph before investigation, b. architectural profile showing several stucco floors and layered occupation phases, c. photo of architectural profile (J. Dobereiner)

A single test pit (11A-1-1) on the eastern side of the E6-4 platform revealed the majority of its height was composed of several overlapping earthen platforms. Two full meters of the structure's height was produced with artifact free (either natural deposits of silt or basket sifted) soil containing no artifacts, a technique in line with other Middle Preclassic earthen structures known from the Southern Maya and Olmec areas. The only differentiation within these layers was the diversity of soils, including seven separate Munsell soil color classes ranging from 10 YR 3/3 Dark Brown to 10 YR 6/4 Light Yellowish Brown. Below these levels, early Middle Preclassic Mamom complex and Pre-Mamom ceramics were found. In March 2013, between field seasons, the land owners removed a large potion from the Western side of the platform to use as architectural fill for ranch constructions. While devastating to site preservation, this presented an opportunity to examine the internal profile of the structure.

Within E6-4, at least three phases of stone walled, earthen platforms capped with tamped earth or plaster were identified, representing remnants of early architectural phases. The overall dimensions of the earliest structures remain undefined, but the most complete structure excavated, E6-4 sub-2, was at least one meter in height and five meters wide. There was a clear emphasis on rebuilding the E6-4 platform, and later shifts towards masonry architecture and away from sifted soil can be seen in the architectural profile.

Given the centrality of E6-4 throughout the site's history, it is interesting to note the presence of eastern ceremonial platforms in other Usumacinta architectural plans in the region (Figure 4.4). At El Lacandon, Chiapas, the Structure 1 site pyramid is oriented at 30 degrees and located east of the ceremonial complex (Bravo 2013). At Fideo, a large pyramid and small platform also lie directly due east of the primary site complex. Finally, at La Tecnica, one of the few ceremonial structures outside of the E-group is a mound that lies directly to the east of it.

While heterogeneous, the presence of a single structure east of the site ceremonial core is one of few features that appear consistently; no such structure is present to the north, south, or west of these site centers. Though these mounds appear in traditional Middle Formative Chiapas plans, for examples at Chiapa de Corzo and La Libertad, the "eastern mound" is a uniform feature in Usumacinta site plans - nowhere more clearly than at Rancho Búfalo, where it remains a dominant feature throughout the site's history.

4.2.5 Similar but Different: The Hybrid MFC Group at Rancho Búfalo

These similarities and differences from traditional Middle Preclassic architecture offer a window into decision making in the Usumacinta River Valley. I suggest a construction history in which the first ceremonial structures built in the region were low earthen platforms like structure E6-4 at Rancho Búfalo. These were oriented at 30 degrees east-of-north, in line with locally significant astronomical or geographic alignments that characterize the Usumacinta River Valley throughout its occupation history.

While the significance of this public structure was maintained at Rancho Búfalo, along with the 30 degree orientation, broader geopolitical shifts in the Middle Preclassic prompted changes and engagement with broader traditions of the Mesoamerican world civilization which became progressively more widespread and homogenized across regions. Elites of Rancho Búfalo actively incorporated these trends as they travelled and encountered traders from external communities who followed east-west and north-south routes of travel near the site. The abundant presence of long-distance trade goods such as obsidian, and several finds of marine shell, reinforces that there was active contact between Rancho Búfalo and other communities in the Maya highlands, coasts, and beyond. Community planners at Rancho Búfalo articulated with these foreign ideas, including those related to MFC related structures, with major implications for development at Rancho Búfalo.

Instead of adopting these trends rapidly, as occurred in other parts of Western Chiapas and the Maya Lowlands, Rancho Búfalo's residents employed a comparatively measured approach. They expanded their site core to the west of their ceremonial platform, and built several extra-local architectural forms traditionally connected with the MFC pattern. This never extended to the E-group, however, and this complex almost never appears at Usumacinta centers. While Rancho Búfalo's residents employed a north-south orientation in constructing structures relative to each other, they also maintained the culturally central 30 degree orientation in individual structures. Similarly, despite shifting some focus to these new ceremonial structures, E6-4 continued to be actively used and developed through time, and remained the largest structure by volume at the site throughout its occupation history.

This conforms to patterns of social continuity in other contexts exposed to foreign material culture: new choices that both maintain local traditions, while engaging with globalized trends of interest to non-local visitors (Mills and Walker 2008; Silliman 2009). Elites from Rancho Búfalo were aware of foreign traditions through their own movement, and from those passing through the site from other regions. Both their local prestige, and their connectedness to extra-local communities, were facilitated by emphasizing new structure types, material culture, and rituals that were valued beyond the Usumacinta. However, the continuance of local trends throughout this, demonstrates a determination to maintain their systems in the face of emergent extra-regional trends. In the Late Preclassic, other Usumacinta centers began to articulate more actively with Rancho Búfalo, and intraregional connectivity becomes increasingly crucial for maintaining local identity in the face of increasingly influential non-local traditions, and a shift towards an outward looking, extrinsic approach to public constructions.

4.3 Architecture and Community Building in the Late Preclassic Middle Usumacinta

During the Late Preclassic period, architecture and monumental structures continued to be a key tool in integrating nomadic and dispersed people into Mesoamerican settlements (Doyle 2012; Estrada-Belli 2011; Inomata 2006; Inomata, et al. 2015; Ringle 1999). In addition to Middle Preclassic E-groups, ballcourts, and plazas, triadic groups became increasingly common (Szymanski 2013; Velásquez Fergusson 2014). Beginning at this time, centers like El Mirador, Tikal, and El Ujuxte emerged, built around providing a complete complement of ritual architectural assemblages and becoming full-service ritual centers (Chase and Chase 2012:258; Golden 2013; Love 2011a; Ringle 1999). Often these ceremonial complexes were constructed on a monumental scale, such as the Danta triadic group at El Mirador (Howell and Copeland 1989). These urban centers incorporated populations from the small non-territorial communities that surrounded them, fueling rapid growth of ceremonial cores exceeding 400 hectares. Alongside the culturally incorporative pressure of the Mesoamerican "world civilization" and its cultural networks of meaning, these large centers began to exert a political incorporative pressure across the landscape. Their regional and extra-regional influences may have depleted population and strained trade routes, impacting even distant centers, such as Usumacinta River Valley communities (Matheny 1986; Sharer 1992).

These changes would have placed pressure on ruling elite in the Usumacinta region to retain their local populations. Their resulting decisions led to the maintenance of Middle Preclassic population levels, and also prevented aggregation around a single massive center or secondary state in the Usumacinta River Valley. These small centers accommodated extra regional influence by changing how they related to one another, in large part through their complementary architectural assemblages. This allowed them to develop a distributed polity composed of several centers across the landscape without a single paramount community (Demarest 1992; Fargher, et al. 2011; Tambiah 1977). Each Usumacinta site contained one of three ritual architectural complexes: a ballcourt, an E-group, or a triadic group, alongside large plazas to host regional populations (Golden 2013; Inomata 2006). When the Late Preclassic Maya world necessitated ritual access to all of these structures, collectively, Usumacinta centers developed to endogenously possess the full host of necessary community functions. This drew these centers closer together, and allowed them to construct a geographically distributed social community. The distribution of these architectural features across the region is as follows:

4.3.1 E-Groups

E-Groups appear across the Lowlands at Uaxactún, Nakbe, El Mirador, Tikal, San Bartolo, and sites beyond into Chiapas and the Olmec area (Aimers and Rice 2006:81). They traditionally possess a single radial pyramid, and are solsticially oriented with three other structures located on a platform to the east along a north-south axis. Sighting from the top the radial pyramid, the sun rises over one of the three other buildings during equinoxes and solstices (Figure 4.6). Increasingly so, these ritually aligned groups are considered the founding ceremonial structures in the Maya Preclassic and Classic, and represent key aspects of early Maya community development (Chase and Chase 1995; Doyle 2012). Instead of being considered precise astronomical observatories, they are understood as structural foundations for a broad range of rituals and community building events related to the sun and agricultural systems.

It has been touted in all of these contexts as the ur-communal structure, and a consistent feature to facilitate communalism and early Mesoamerican urban societies. During the Late Preclassic, E-Group structures often acted as the focal point of dominant architectural groups, such as the Mundo Perdido at Tikal (Fialko 1988 ; Laporte 1995).

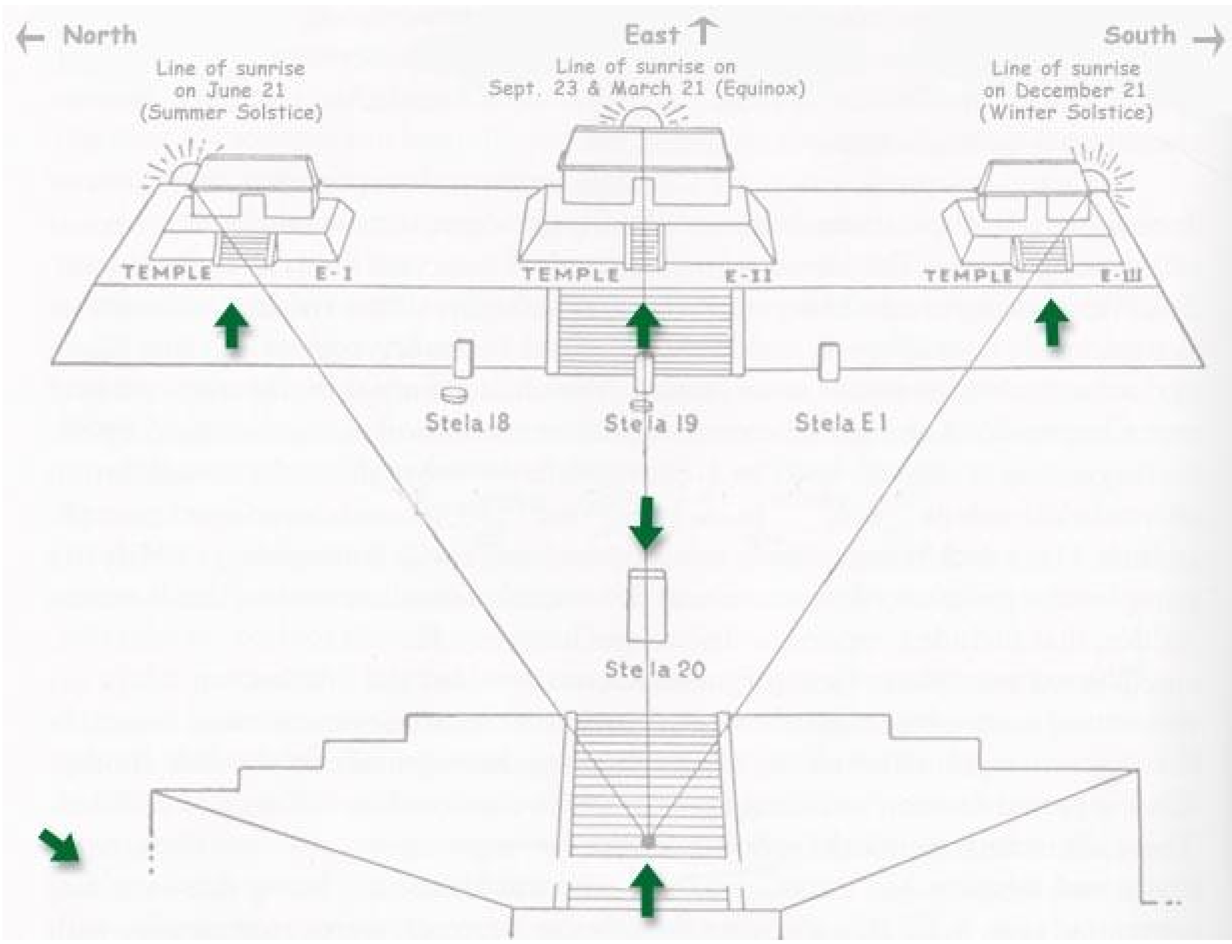


Figure 4.6 E-Group diagram (Sharer and Traxler 2006)

In contrast to Preclassic sites across Southern Mesoamerica, the majority of known early centers from the Usumacinta River Valley do not contain E-Groups. The notable exception is La Técnica, a site center in Guatemala located near Yaxchilan (Doyle 2012; Golden and Scherer

2006:7). Within several days walking distance from the other Usumacinta centers, this E-Group may have served a regional role entering the Late Preclassic Period.

4.3.2 Ballcourts and Twinned Structures

Several sites in the Usumacinta region have twinned structures that may have served as ballcourts, including Rancho Búfalo, El Porvenir, Guatemala and Fideo, Guatemala (Kingsley, et al. 2012). The twinned structure at Rancho Búfalo was on a raised platform with a 120 degree alley (D6-8), and differs in several ways from traditionally defined ballcourts. At 15 meters long, it is not substantial, though similarly sized ballcourts have been detected in Preclassic at sites from Belize, throughout Petén and into the Northern Maya Lowlands (Anderson 2012; Hansen 1998:74; Scarborough, et al. 1982). The open endings of the Rancho Búfalo twinned structure relate it to some of the most basic and earliest ballcourt examples from Mesoamerica (Taladoire 2001:106). Small, open-ended ball courts have been found in later period contexts such at El Tajin, Veracruz (Fox 1991:234). The primary contrast is that this structure pair is raised, contrasting with traditional sunken or ground-level ballcourt positions which would have ensured visibility of the game and tied these places of violence and sacrifice to the underworld. Later exceptions do exist, however, such as the Classic period ballcourts on the acropolis of Tenam Puente, Chiapas.

Twinned structures were used for events beyond ball playing in the Classic period (Taube and Zender 2009). Ballcourts were also central ceremonial structure in sociopolitics and the exchange of long-distance elite trade goods (Fash and Fash 2007). They were also ritually loaded with underworld connotations, and the twinned structure's position at the geographic south of Rancho Búfalo further suggests this connection, as Ashmore has argued at a wide range of Maya sites (Ashmore 1992; Houston 2014a; Scherer 2015). Most of this evidence has been from Classic period and ethnohistoric contexts, however, and scholars are continuing to work towards understanding how these structures were used in the Preclassic period.

While it is not possible to reconstruct the particular rituals performed at the Rancho Búfalo example, the twinned structure was a prominent feature at the site, and one designed to be visible and accessible to a large swatch of the population. This is indicated by the varied zooarchaeological remains found associated with the base of the D6-8 platform, alongside a substantial concentration of food preparation devices such as manos (n=8) and metates (n=7), representing approximately half of the site-wide assemblage of ground-stone lithics. Such findings are in line with ethnohistorical and archaeological evidence that indicates feasting and food preparation were also central to the use of these structures (Fox 1996:491).

4.3.3 Triadic Groups

Triadic groups are composed of three structures on top of a single platform. Towards the back of the platform, is a single large pyramid, flanked on either side by two smaller structures towards the front of the platform (Estrada-Belli 2011:67; Szymanski 2013:7). Triadic groups do not share a standard orientation, varying depending on site and context (Szymanski 2013:25). Compared to the hypothesized calendrically driven solstitial events at E-Groups and game rituals at ballcourts, the use of triadic groups is less clear.

The triadic form, however, is evocative of the hearthstones, a founding trio of rocks referenced in the Popol Vuh and modern Maya rituals, as well as in connection with world-beginning events in mythological descriptions from Quirigua, Guatemala and Palenque, Chiapas (Taube 1998). They often feature substantial masks, and it has also been suggested their symbolism relates to myths of the Principle Bird Deity (Szymanski 2013:130). They directly articulate with trade and control of inter-regional interaction, especially in the Usumacinta watershed (Gunn, et al. 2014:106). Triadic groups are common throughout the Maya area in the Late Preclassic, with notable examples including the Danta Complex at El Mirador, Guatemala and the Las Pinturas Group at San Bartolo, Guatemala (Howell and Copeland 1989; Saturno 2009:118). Despite this widespread presence throughout the Maya area, triadic groups are rare in the rest of Mesoamerica (Velásquez Fergusson 2014).

In the Usumacinta River Valley, a triadic group was found in early phases of occupation in the southern court of Piedras Negras. In contrast to the use of ballcourts or E-groups, this center utilized a triadic group as a ceremonial centering structure. Piedras Negras did not possess any other ritual architectural assemblages during the Late Preclassic Period, and thus complements the E-group found at La Tecnica and ballcourts from El Fideo and Rancho Búfalo.

In later periods similar assemblages propagated more broadly; a hill and associated architectural group 1 km distant from Rancho Búfalo, referred to as the Hearthstones Group, is evocative of the triadic pattern (Figure 4.7). This tri-lobed hill has structures on top of each, and does not articulate with the low ranges defining the valley walls. Preliminary work indicates that the constructions on top of the hill date to the Classic Period. While the founding position of Rancho Búfalo and its orientation may relate to this group, it does not appear to have had a triadic architectural assemblage during the Middle or Late Preclassic. Instead it seems in line with the Cross Group at Palenque, another group of three temples whose triadic nature is partially predicated on natural topography, but likely a separate phenomenon from the Late Preclassic tradition (Stuart and Stuart 2008:27).

a.

b.

Figure 4.7 Hearthstones Group: a. map with satellite imagery b. view of mountain from ground level (J. Dobereiner)

4.3.4 Plazas

In all of the Usumacinta cases explored here, ceremonial structure complexes like E-Groups, ballcourts and triadic groups were located adjacent to public plaza spaces. Plazas were crucial structures to engage in community building and to mediate regional interaction (Doyle 2013; Harrison-Buck 2012; Inomata 2006). Each site in the proposed Usumacinta collective contained plazas that were larger than necessary to contain the population of the site itself. Some degree of caution is necessary in asserting plazas were necessarily designed to be entirely filled with spectators, given that much of the site design may have been to manipulate perspective, inspire awe, and make visitors feel “small” (Leone 1996). However, the benefits of such a display of space and control would be directly proportional to the number of people who could experience it, and the attendance of spectacles designed to employ it (Geertz 1980:12).

At Rancho Búfalo, three individual plazas are bound on three sides by masonry and earthen architecture (Figure 4.8). Based on typologies established from other site centers, it appears that each would have performed a different role of offering access to different sized publics (Table 4.1). Given Rancho Búfalo's geographic position and relatively small size, who was being served by these plazas and when is of high importance to understanding the site development and local relationships with other centers.

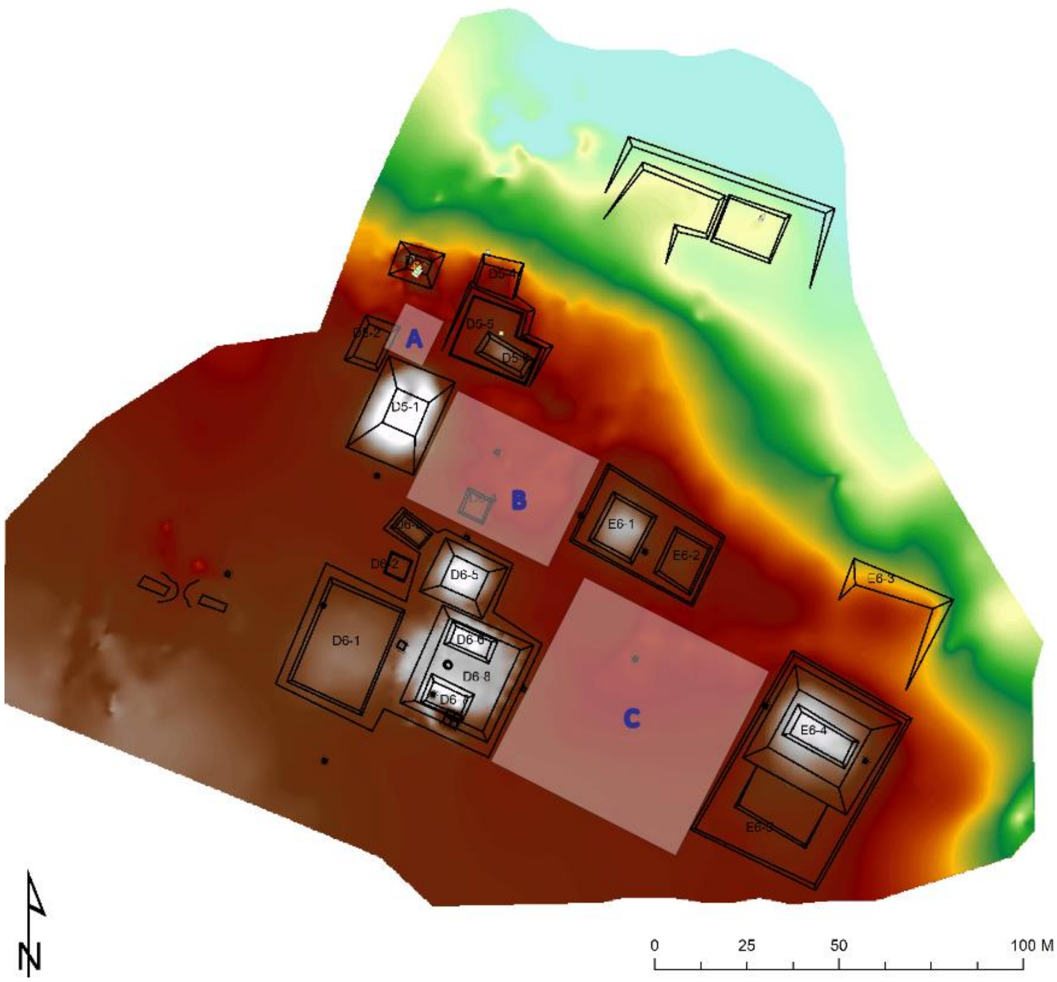


Figure 4.8 Plazas at Rancho Búfalo, Chiapas, México (J. Dobereiner)

The smallest, Plaza A, is bound by several low structures and the site pyramid, represents the ceremonial precinct. Measuring 20 by 15 meters, and visually cut off from the rest of the site center, it had very restricted access and would likely have hosted the most private of elite practice, as further indicated by the tomb structure and a series of serpentine celts, both suggestive of uses similar to La Venta Complex A (Drucker 1959). It articulates with Plaza B, which is bound by A and B and at 45 x 45 meters, is more than 5 times the area. As a more open plaza with oblique views of the ceremonial core, it was likely a mixed used area for ritual inclusion of Rancho Búfalo's entire population, and local scale place-making events.

Finally, Plaza C measures 60 x 60 m, and is bound by both the ballcourt (D6-8) and the substantial earthen platform (E6-4). It is open to the south, allowing "overflow" spectators who would be able to see ongoing public events. Its use as a gathering point was apparently supported by food preparation and feasting, as suggested by the manos, metates, animal bone, and freshwater jute shell found near the D6-8 twinned structure complex. Ritual objects have also been found, including a phallic effigy, large ceramics for use in public food preparation and serving, and a bark beater which could have been used to craft elite and ritual paper goods. Given the nature of regional settlement and the unimpeded view of the ballcourt, this large plaza would have been useful for intersite events involving Preclassic communities from throughout the Usumacinta Region (Inomata 2006). In other sites with clearly defined E-Groups, triadic groups, and ballcourts, the central ritual structure similarly articulated with the site's largest plaza, allowing participants from the local site and beyond.

Table 4.1 Estimated Plaza Capacities at Rancho Búfalo

Plaza Letter	**Area (m^2)**	**Capacity (.46 m^2/pp)**	**Capacity (1 m^2/pp)**	**Capacity (3.6 m^2/pp)**
A	300	652	300	83
B	2025	4402	2025	562
C	3600	7826	3600	1000

4.3.4.1 Late Preclassic Architectural Styles and Integration

The Late Preclassic was a time of active adaptation by the low-population Usumacinta River Valley, as they interacted with, and were influenced by increasingly centralized surrounding regions. Major centers like El Mirador and El Ujuxte increasing dominated hinterland communities, and integrated populations (Love 2011a). In part, this domination was driven by their role as full service ritual centers, with monumental architecture, ballcourts, E-groups, triadic groups, that would allow them to centralized populations and engage coercive force (Golden 2013).

In meeting these extra-regional challenges, residents of the Usumacinta River Valley did not consolidate into primate centers, and instead developed a distributed community of centers within the Usumacinta River Valley. The particulars of this cooperation remain obscure, but it may be in keeping with the alliance-building and fissioning of centers that emerged in the Postclassic Naco Valley of Honduras (Schortman and Urban 2011). Several groups variably attempted to foster sufficient household cooperation to dominate and consolidate power, yet over two centuries they were “never able to claim absolute dominion over the basin’s population”(Schortman and Urban 2011:220).

The collective set of Usumacinta centers united to build a segmented urban community with each individual site contributing its own ceremonial structure. By distributing their ritual architectural complexes among a series of aggregation points and articulating them with large plazas that could fit members from several communities, this region functioned as a Late Preclassic collective, and adapted to and managed external influences from the expansive polities surrounding them. This delayed the eventual political aggregation that already characterized much of the Maya Lowlands by this time (Golden and Scherer 2013; Golden, et al. 2008).

4.4 Final Styles: Usumacinta as Maya

Though there was a continuing emphasis on independence and collectivity entering the Late Preclassic, the influence of a crystallizing Maya culture area only becomes clear in the final architectural phases of structures at Rancho Búfalo. While the site footprint and design do not change dramatically, structures and platforms dating to the end of the Late Preclassic are similar to the broader lowland Maya interaction network that finalized in the Early Classic. Connections can be drawn between construction styles and features of masonry structures at Rancho Búfalo and known Late Preclassic and Protoclassic architecture from the Southern Maya Lowlands at sites like Tikal, and Northern Maya Lowland sites including Becán, Campeche and Komchen, Yucatán. I highlight these architectural affinities through investigations at a pair of structures at Rancho Búfalo; D5-3, the location of the Burial 1 Tomb and D6-5, a platform directly northwest of the ball-court.

4.4.1 Structure D5-3 Tomb 1 and Similarities to Tikal

PABC's consolidation of looting in structure D5-3 in 2011 allowed investigation of the architecture involved in constructing the building and the tomb within it (Figure 4.9). The chamber was made of unfinished stone and un-plastered masonry which is similar to Preclassic structures from the Southern Maya Lowlands, including Nakbe and El Mirador (Hansen 1998:64). It measured 3.5 x 2 meters, and was 2.5 meters high. Individual stones varied in size, but were roughly worked, with the most frequent modification involving flattening on their facing surface. The chamber was capped with flat masonry capstones that may have articulated with a large monolith that was stood on end at the western edge of the tomb chamber.

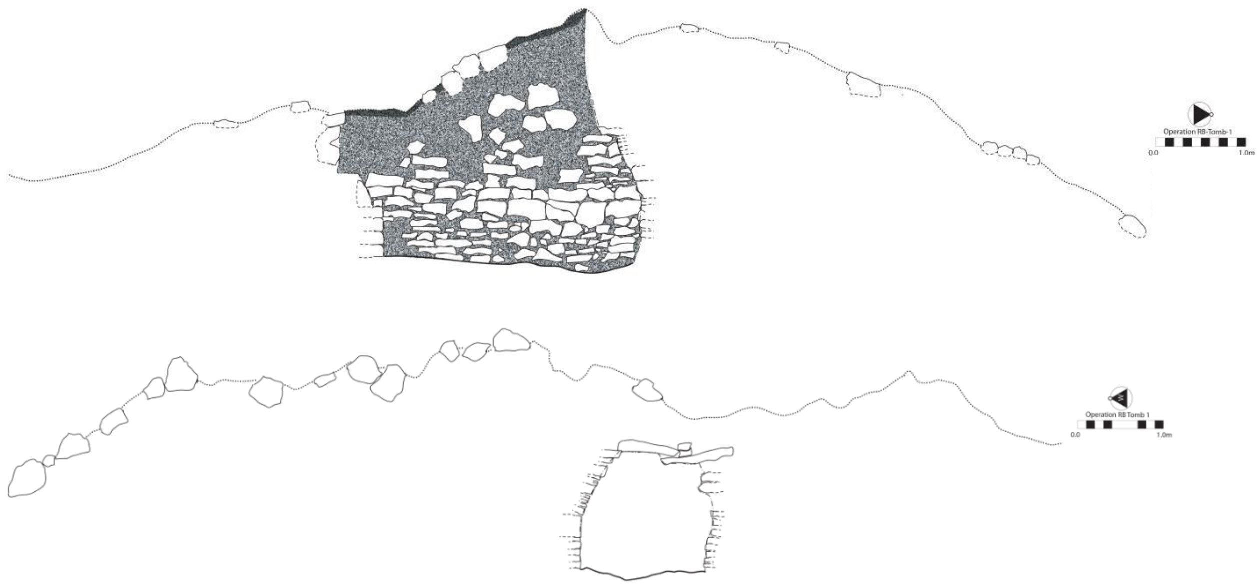


Figure 4.9 Tomb profiles from Rancho Búfalo structure D5-3 from Rancho Búfalo (J. Dobereiner)

Preclassic tombs are uncommon in the Maya Lowlands, and outside of Tikal, all four examples are in natural or anthropomorphic subterranean contexts. Blue Creek, Belize Burial 5 was placed directly into a hilltop *chultun* (Guderjan 2000:2). Chan Chich, Belize Tomb 2 is evocative of the Blue Creek example, as the narrow-opening chamber first through anthropomorphic plaza levels and widens as it enters the bedrock, leading to a form in profile that matches nicely with *chultuns* and other subterranean features (Houk, et al. 2010:232) San Bartolo, Guatemala Burial 4, a putative royal burial dated to 200 BC, the chamber is a large cyst that articulates directly with *chultun* features and is also below the level of the surrounding earth. It is circular in form, and was crudely lined with limestone blocks to establish the burial chamber, before being capped with a giant limestone slab. The Ko' tomb from near Holmul, Guatemala, carbon dated to 300 BC, and perhaps the earliest Maya example, is similarly a *chultun* burial (Skidmore 2011:3). While it terminates in a pair of approximately equally sized natural chambers, only the western lobe contained burial goods, and was also slightly modified to make the walls rectilinear (Skidmore 2011:2). In all of these cases, while some of the profiles evoke later masonry examples, construction is based on excavation below ground level.

In contrast to these subterranean examples are the burial platforms in the early Tikal acropolis. These date to the end of the Preclassic Period at Tikal, and include tomb 85, 166 and 167. All contain elaborate burial goods and underlie larger, likely vaulted structures. Burial 85, believed to be that of the Yax Ehb Xook, the dynastic founder of Tikal, is particularly large and complex, with Preclassic metrics of kingship including jade jester god diadems (Coe 1965:1407; Sharer and Traxler 2006:302). Despite their lavish nature, and centrality at a much larger site, the construction style of these tombs are the most similar to that at Rancho Búfalo.

In all three cases, there is a reliance on small chambers lined with masonry architecture, and a false arch that is similar to the Rancho Búfalo example. Of these examples from Tikal, Burial 167 looks the most similar to Rancho Búfalo D5-3 (Coe 1965:1408). The dimensions are smaller, but the North-South section of Burial 167 is effectively identical to the East-West section of Rancho Búfalo Burial 1 (Figure 4.10). The same construction style and false arch with pair of layered capstones are also mirrored in the Rancho Búfalo case. The interment is believed to date from approximately 0 AD, and contained a dozen vessels, jade fragments and a single male. Like Rancho Búfalo Tomb 1, it was slightly under the surface of a platform, and contained an extended burial that was re-entered in the Classic Period. Like the other early Tikal tombs, it appeared to be integrated into a shrine marking its position under the structure surface; an architectural type dramatically different in role from D5-3 at Rancho Búfalo, but similar in footprint and form (Coe 1965:1408). Due to the destruction of D5-3 before the site's original documentation, the presence of a superstructure cannot be excluded.

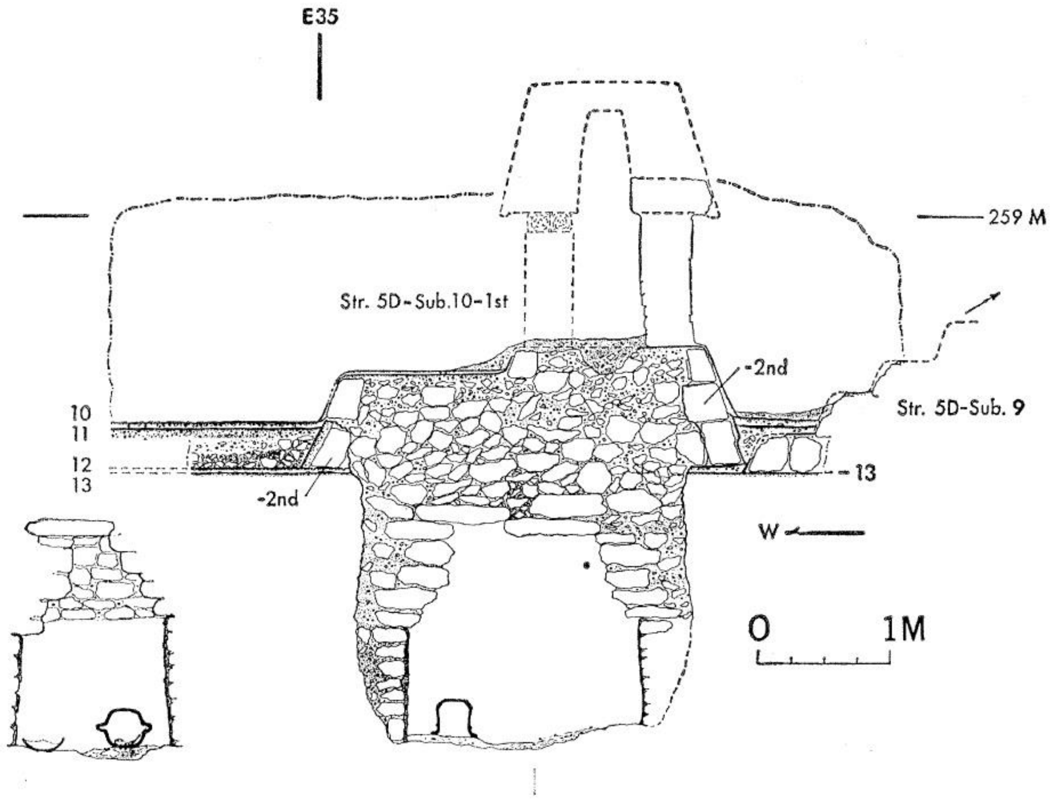


Figure 4.10 Tikal Burial 167 profile view (Coe 1965:1408)

The oldest known tomb from the immediate Usumacinta Area is Palenque Tomb 3 from Temple XVIII-A. While discovered in the 1950's it has recently been AMS dated to 250–420 cal AD (Couoh 2013). The form of this tomb is different than the example at Rancho Búfalo, with a large vaulted room, and a conduit tube leading to the tomb structure itself deep within the temple.

Overall, the Tikal tombs dating to the first century AD are the strongest architectural match to D5-3. The presence of this tomb in the northern portion of Rancho Búfalo is in keeping with the MFC pattern established during the Middle Preclassic at the center, but the style of the architecture resembles the final phases of Late Preclassic architectural traditions in Central Petén. This is suggestive of increasing connections east with the traditional Maya area, as well as their increasingly interest in adopting these styles and operating within a coordinated collective to resist full political incorporation by these burgeoning extra regional centers.

4.4.2 D6-4 Platform

A 2 meter tall platform (D6-4) was constructed directly northwest of the D6-8 ballcourt complex during the Late Preclassic (Figure 4.11). This structure does not fit with the traditional MFC plan, but is similar to a type of Late Preclassic platform which became increasingly common through the Maya area in the lead up to Classic Period nucleated settlements. Over the 2012 and 2013 field seasons it was possible to investigate the base of the platform, and explore how it was designed to meet the plaza, and the nature of its final phase of construction. While primarily constructed of courses of roughly hewn stone and filled with loose dirt and limestone cobbles, a substantial amount of labor was directed toward sculpting and producing a complex first masonry course to the structure. Later courses were removed at some point from the structure, leaving this base layer.

a.

b.

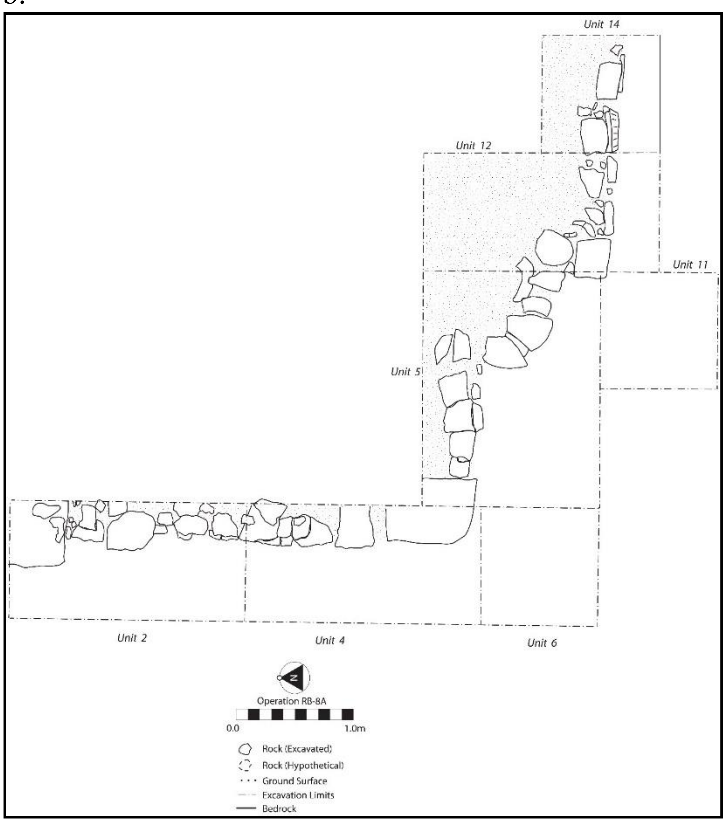


Figure 4.11 2 meter tall platform (D6-4) a. photo, b. plan view (J. Dobereiner)

The northern wall of the building is a standard three course set of stones approximately 50 cm high, but the structure corner resembles examples from Yucatán and Campeche. The corner itself is constructed a single well sculpted megalithic stone. The wall then continued on, and arrived at another curved feature. This curved feature, which almost identical to the first corner in plan view, is constructed of a series of eight stones designed to also make a similar curve. These features may have been plastered in the past, rendering both examples visually similar, despite the proportionally higher degree of finishing required to produce the first stone. Finally, a step juts out from the wall, representing a third component of the corner, until the platform finally continues straight. The final face, however, is slightly angled and evocative of apron-moldings known from Northern-Yucatán centers, but also found throughout Petén and as far west as Protoclassic Chiapa de Corzo (Lowe and Agrinier 1960:fig. 22).

The most similar structure to the Rancho Búfalo example is structure XXVIII at Becán, Campeche, dated to the Late Preclassic based on a cached Usulatan vessel at its base. Structure XXVIII was built with similarly cut limestone blocks, was filled with loosely packed rubble, and possessed analogous rounded corners (Ball and Andrews 1978:7). It measures 7 m east-west and at least 5 m north-south, but was likely longer before being destroyed as part of the Becán earthworks. Similarly, the low walls extend to a maximum height of 110 cm but are often less. On either side of the 2.25 m staircase, there is a compound corner, complete with a recessed basal element that makes a crude apron molding that resemble Rancho Búfalo D6-4 (Figure 4.12) It is one of a series of similar platforms, most even shorter at 30 to 50 cm, that were not investigated (Ball and Andrews 1978:10). The most critical formal characteristic that links these structures are the rounded corners which are common in similar Late Preclassic contexts (Adams 1977b:82).

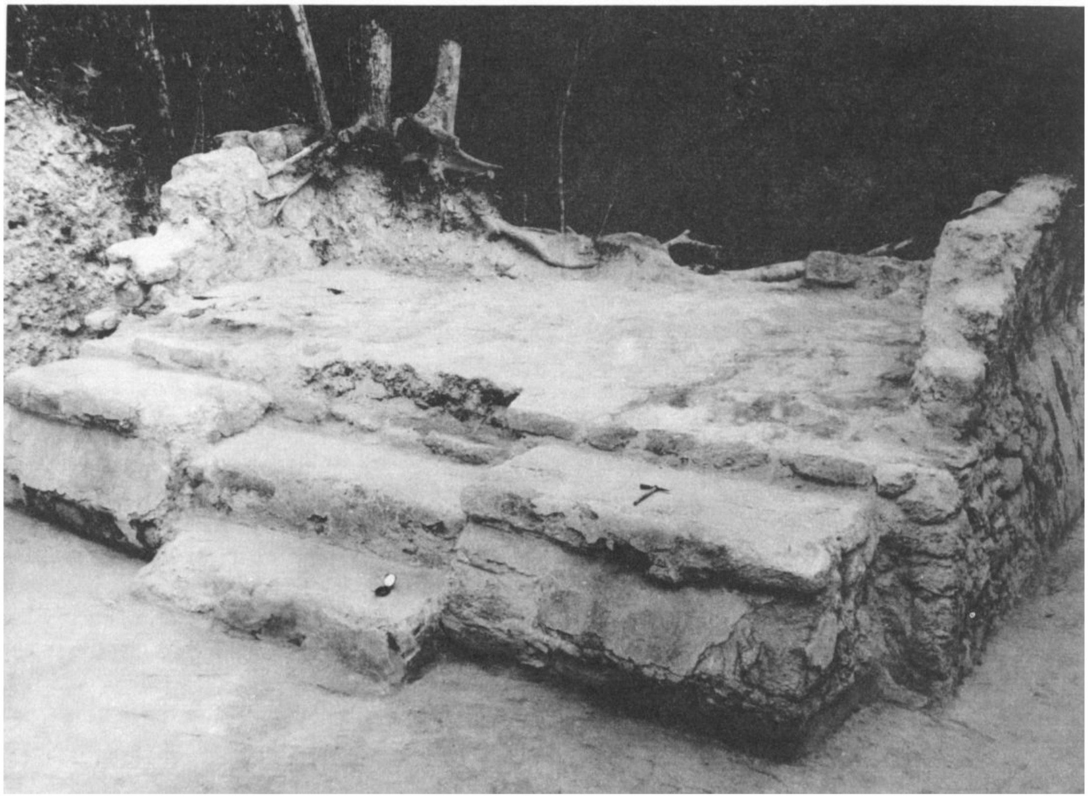


Figure 4.12 Structure XXVIII at Becán, Campeche (Ball and Andrews 1978:7)

Similar rounded corners on low platforms are found in the earliest architectural phases at Komchen, Yucatán, one of two Preclassic satellite centers surrounding Dzibilchaltun. Komchen structure no. 450 had a long and complex building history, but during Nabanche Phase 2 the most notable feature was a single 7 meter long step approximately 85 cm high (Andrews, et al. 1980:43). While largely destroyed, the southwest corner of this step contained a clearly rounded end composed of a single stone (Figure 4.13). A series of additions and modifications followed which made the structure even more evocative of the D6-4 platform form. It was first flanked by "a pair of symmetrical wings" beginning several centimeters behind the front of the main platform. This would have given an overall look similar to the compound corner from Rancho Búfalo D6-4 (Andrews, et al. 1980: 44). Entering Phase B, a second higher rounded corner was produced on no. 450 that was recessed in the platform and did not obscure the first example –

again giving a compound form similar to Rancho Búfalo (Andrews, et al. 1980:45). The construction style during both these periods was similar: stones with limited modification, 25-40 cm long and 15-25 cm high, 15-20 cm deep, and placed in rough courses with rubble fill (Andrews, et al. 1980:53).

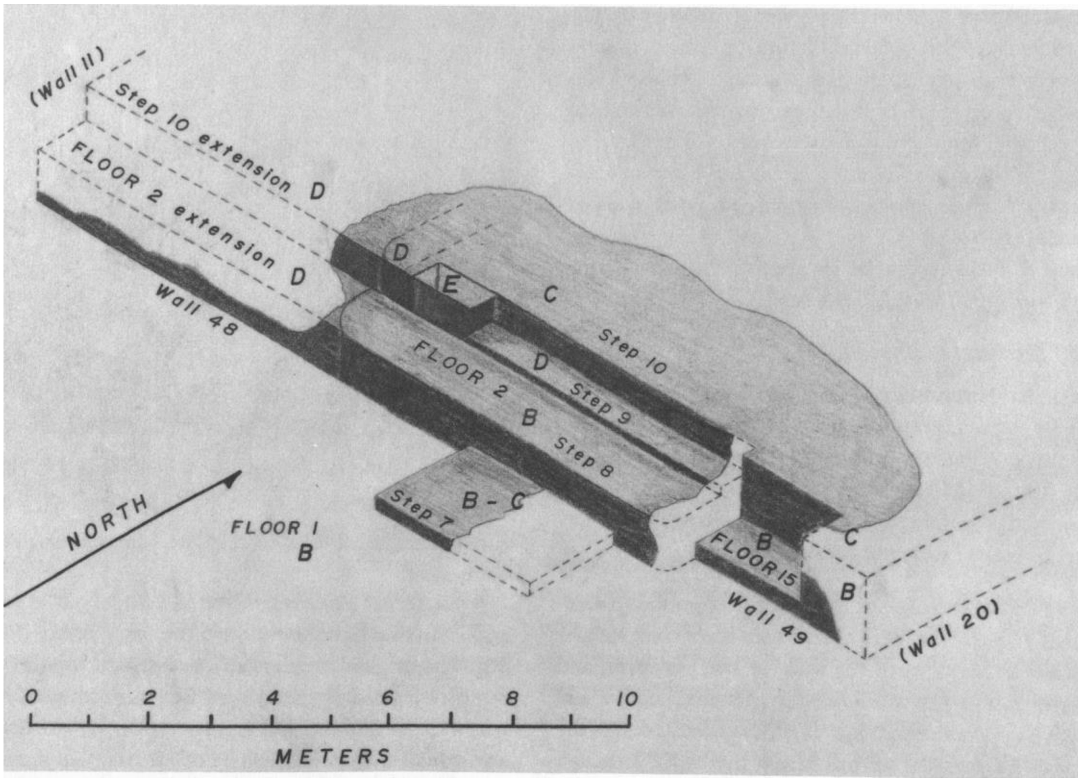


Figure 4.13 Structure no. 450, Komchen, Yucatán (Andrews, et al. 1980:43)

While Rancho Búfalo's example was built in a single time period instead of representing a series of additions, the overall form of structure D6-4 resemble both the Becán and Komchen examples. The similarly in construction styles represents one of whole wholesale uses of a foreign technique, and a dramatic departure from the earthen and rough-cut masonry platforms used in earlier phases at Rancho Búfalo at buildings like E6-4.

4.5 Conclusions

Throughout its occupation history, Rancho Búfalo's residents negotiated actively with extra-regional forces, and mediated these relationships through different architectural choices. There was a shift from using the built environment to enable site specific strategies of extra-regional negotiation in the Middle Preclassic, to inclusive regional politics and distributed urban communities in the Late Preclassic. Choices in architecture and site plans illustrate tensions between local and extra-local traditions, and can be used to reconstruct processes of adaptation in material culture.

Middle Preclassic Rancho Búfalo was initially founded with a eastern earthen platform, E6-4. This structure was oriented at 30 degrees east-of-north, a long-standing Usumacinta-local orientation that appears throughout the Preclassic and Classic periods. Throughout the site's occupation history it was the central ceremonial structure, however, its role changed through time. Under influence from the emergent Mesoamerican world civilization, a modified MFC set of structures were built to the west of this platform. While E6-4 continued to be used and modified, and several ceremonial functions involving extra-regional dignitaries and extra-community members became focused on the MFC structural set, though no E-group was ever built. This allowed site residents to maintain a balance between including new traditions from surrounding areas, while maintaining their own unique, local identity.

During the Late Preclassic, the expansion and growth of dynamic city-centers throughout the Maya area forced a socio-politically based re-assessment of Rancho Búfalo's local-scale negotiation. From a Middle Preclassic policy of local accommodation, they moved instead towards developing regional network relationships with other Usumacinta centers. While the overall population of the region did not grow during the Late Preclassic, by working together, these centers established a segmented urban community. By relying on this collective approach, Rancho Búfalo and other Usumacinta residents were able to maintain their localized traditions, and avoid the loss of autonomy to extra-regional polities or practices.

While these dynamic approaches to extra-regional influence helped Rancho Búfalo maintain its role as a semi-independent center using the local Usumacinta tradition, this success did not extend into the Early Classic period. Already by the final phases of construction, wholesale and unmodified uses of Maya-Lowland style traditions begin to appear in D6-4 and D5-3. Though the related aggregation events have not yet been detected archaeologically, during this time the population of Rancho Búfalo and most hinterland sites throughout the Usumacinta River Valley declined dramatically (Golden and Scherer 2013; Golden, et al. 2008). This population decrease correlated with the massive expansion of a small handful of centers: Palenque, Piedras Negras and Yaxchilan. While these would go on to re-populate landscapes, these were always highly managed satellite centers, and the independence of hinterland communities never reached its Preclassic level (Scherer and Golden 2009).

CHAPTER 5 - CERAMIC ANALYSIS

Ceramic vessels are among the most practical of objects; the majority are cheap to produce, heat resistant, and easy to replace (Sinopoli 1991). This has made them a key resource for archaeologists to reconstruct chronologies, and study utilitarian culture processes in food preparation and storage (Rice 1987). Yet, across the ancient and modern worlds, ceramics have also had a frequent role in signaling social identity. A separate set of scholarship has focused on the meanings behind their production, styles, and symbolism and their relationship to ancient ethnic groupings and trajectories of community evolution (Bowser 2000; Fash and Sharer 1991; Janusek 2005; Ur, et al. 2007). Forms, styles of production, and the design elements placed upon vessels can be interpreted as both doxic representations of self, and actively signaled identities (Capone 2004:83; Plog 1980; Swartz 1997). The inherent plasticity of ceramic material, and the variety of steps and techniques that go into their production, make them an apt vehicle to study these processes of transculturation and exchange. This is particularly the case in regional peripheries, where changes in material culture and accompanying social processes often precede their uptake in urban centers (Ogundiran 2001:39).

The Usumacinta region has been a locus of particular note in studies of Preclassic Mesoamerican ceramics, given its relative equidistance from major sites of the traditionally defined Olmec and Maya regions. Scholars have analyzed this region's ceramic through the lens of a presupposed relationship between Maya and Olmec, and have suggested that the easternmost Olmec geographical territorial was bounded by the Middle Usumacinta River Valley (Bravo 2013:14-16; Lowe 1991; Ochoa 1983). In particular, they have used ceramics as a primary line of evidence to construct a borderland narrative for the region, and have classified materials within "…more at home on the fringes of the Maya area or outside it than within the Maya lowlands" (Rands 2007:33).

There are notable shortcomings, however, in Robert Rands and other's analyses of this region's Preclassic ceramics. They treated the Olmec and Maya as essentialized, and oppositional groups, leading them to pre-suppose that a region between their heartlands would function as a borderland (Guernsey, et al. 2010; Navarrete 1978; Parsons 1986). Their results were further pre-determined by a use of a type-variety analysis that sought to fit ceramics from the Usumacinta region within already established typologies (Englehardt 2010; Rands 1969). Further, they were forced to draw upon a small sample of Preclassic ceramics in their studies on the Usumacinta, as compared to other parts of Preclassic Southern Mesoamerica. These few available collections were recovered from later-period architectural fill, with no primary context (Bravo 2005).

The ceramic analysis employed at Rancho Búfalo was designed to address these shortcomings. Instead of type-variety, an attribute analysis was employed that included surface finishes, and enabled clearer comparisons within and beyond the Maya area. The sample was also significantly larger than those used in previous studies of the region's Formative; the assemblage consisted of 32,523 sherds and four complete vessels, most of which are Preclassic. Their analysis revealed forms and surface treatments with overarching similarities with Petén-based traditions established at Uaxactún and Ceibal, Guatemala but also unexpected ties with Northern Lowland sites such as Komchen, Yucatán. The design elements that were present, on the other hand, offered evidence for cross-regional links to traditions associated more broadly with the Mixe-Zoquean region.

These results demonstrate that the community at Rancho Búfalo actively communicated and shared styles with centers beyond the Preclassic Southern Maya Lowlands. They simultaneously used techniques associated with multiple parts of Formative Mesoamerica. This finding contributes to breaking down perceived boundaries between various sub-regions and cultures within the emergent Mesoamerican "world civilization." Rancho Búfalo's residents used a range of ceramic production styles and design elements to signal multiple audiences. The ability to do so offers an anthropological case study in how material culture can be incorporated to maintain and reflect local identity, even if at first it suggests a compromise in core identity.

5.1 Anthropological Approaches to Ceramics

There are several relevant approaches to understanding the styles and technological choices used by past societies to produce ceramic vessels. Ceramics, like other items of portable material culture, articulate with actors at the individual-level. Archaeology rarely grants access to this level of specific action, but the plasticity of ceramic allows polysemy to be inserted into a single vessel, offering the possibility of simultaneous expressions of identity by a single individual. Though there are communal aspects in pottery production, the use and deposition of vessels has direct implications for the individual possessing the item. Especially in contexts where multiple groups have visual access to one another's materials, divergent forms may be developed in an effort to signal identities across social boundaries (Hodder 1982:31; Wiessner 1985).

While it can be tempting to directly correlate ceramic attributes with specific groups of people, or beliefs, there are also limitations to this technique (Jordan and Schrire 2002; Quinn 2009; Stoltman, et al. 2005; Waksman 2007). The tension in directly tying ethnicities to ceramic material culture is summed up well in the cautionary aphorism that pots do not equal people (Kramer 1977). It has even been asserted, from ethnographic examples, that “ceramic style has little symbolic importance for pottery users in distinguishing ethnic identity” (Dietler and Herbich 1994:460-461).

Part of the issue is that some material decisions may not be designed to signal; they may occur randomly based on individual decisions in a way that is not meaningful for analysis of group identity (Wiessner 1985). For example, Donald Lathrap found the stylistic variations among modern Shipibo-Conibo potters of Peru were driven first and foremost by individual cross-community visitation, adoption, and genius (1983:29). Previously, it was erroneously assumed that these styles stayed within a single matriline and could be used to discern patrilocality or matrilocality in Pre-Columbian Andean societies (Lathrap 1983:26). Unfortunately, ease of copying by others is "the flip-side of overt signaling through objects made to be used in the public sphere” (Cheetham 2007:24).

Attempts to associate ceramic style with monolithic groupings have since been revised to explore how integration of foreign traits can mark resistance, negotiation, and a variety of techniques of appropriation that may not indicate any true concession of self-determination (Wilkie 1997). The adoption of non-local ceramic objects or styles must be analyzed critically as only one component of a broader process of negotiation. Individuals most often employ them in a manner that does not compromise “essential” identities; the integration of new material culture into communities is often used as a tool to sustain long standing cultural practices (Silliman 2009:213). In the case of ceramic style and vessel typologies, these processes can occur in a range of “borderland” contexts, from the adoption of linear band keramik to enhance, not replace, mesolithic lifeways in Europe, to the use of Spanish-Style vessel forms in Jemez after the Pueblo Revolt of 1680 (Liebmann 2008:367; Robb and Miracle 2007:112).

In examples like these, connected spaces and social integration between groups proceed through media that include material culture. Archaeological analysis of these materials, then, lends insight into how people live together, and when they choose to adopt material traits from others. Different audiences may read different meanings into these modes based on their own perspective. The integration of non-local stylistic traits, and the clear combination of variables and traditions from a range of communities fits within broader narratives of hybridity, even in contexts without clearly established geographic frontiers or which contain co-existing social groups (Jordan and Schrire 2002:257). With this anthropological background in mind, it is useful to survey the studies of Preclassic Mesoamerican ceramic which offer context for the Rancho Búfalo assemblage.

5.2 Ceramic Typologies of the Preclassic Maya Area

Most analyses of ceramics in the Maya area have been designed to further culture historical ends, and have been based on the type-variety analysis developed in the Southwest and then applied to the Maya starting with Uaxactún, Guatemala and Barton Ramie, Belize (Gifford 1976; Smith and Gifford 1967; Smith, et al. 1960; Willey, et al. 1967:290). A type "represents an aggregate of visually distinct ceramic attributes already objectified within one or (generally) several varieties that, when taken as a whole, are indicative of a particular class of pottery produced during a specific time interval within a specific region" (Smith, et al. 1960:333). New varieties that are found in the process of classification are explicitly hoped to fit within an already extant typology. It is, in a general sense, an intensive effort to merge a series of modes and attributes into a single refined classification (Dunnell 1986:169).

This framework has enabled easy cross-site comparisons and uniform chronologies; broadly speaking, scholars have established three Preclassic Maya ceramic phases named after Uaxactún and Altar de Sacrificio's typologies: Xe (900 – 600 BC), Mamom (600 – 300 BC) and Chicanel (300 BC – 250 AD) (Figure 5.1) (Sabloff 1975:9; Smith 1955). These periodizations encapsulate a variety of wares, shapes, decorations, and design styles, and have been amended, but largely left intact by continuing scholarship on the Preclassic (Sabloff 1975; Smith, et al. 1960:330). This includes Southern Lowland sites like Tikal, Belizean sites such as Cuello, and Northern Lowland sites including Becán and Komchen. Ties have also been established to the Highland centers like Kaminaljuyu, and recently refined to better fit with the aggregate Lowland chronology of ceramic usage and change (Inomata, et al. 2014).

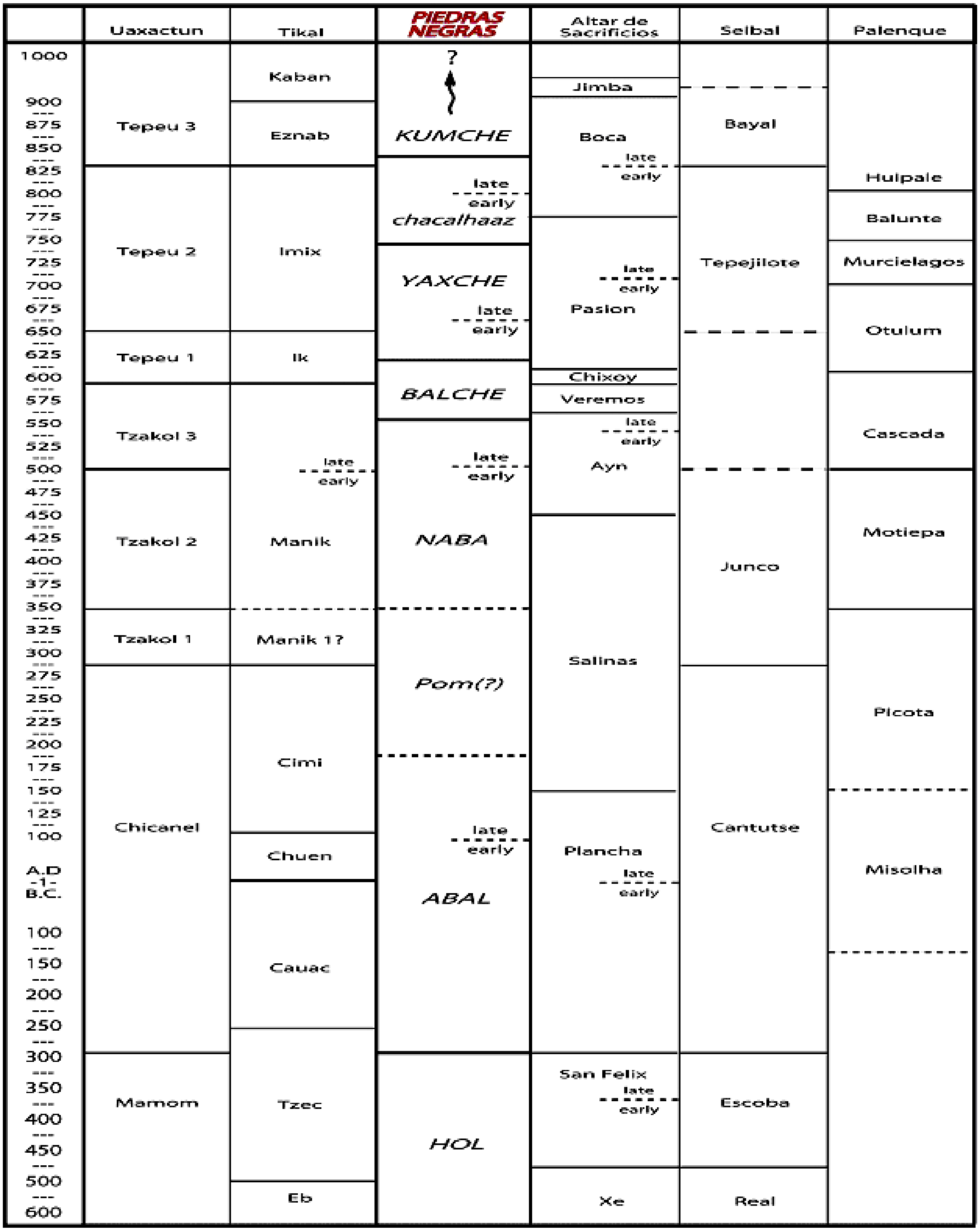


Figure 5.1 Ceramic Sequences in Rancho Búfalo Region (Muñoz 2004)

Xe ceramics, as established at Altar de Sacrificios, have been connected with a range of early complexes such as Real at Ceibal and Early Jenny Creek and Bladen ceramics in Belize (Andrews 1990:7; Gifford 1978:218). Following Sabloff (1975:9-10), ceramics with slipped surface finish (Rio Pasión Slipped as defined at Altar de Sacrificios and Ceibal), tend to be dull and non-waxy, in contrast to later phases. A variety of slip colors are represented, including whites, creams, and reds. Paste cores are high contrast with very dark central cores and buff-fired surfaces. Most decoration, when present, is post-slip incised (Sabloff 1975:51). Flared and outcurved sides, including everted rims, dominate vessel forms. However, incurved constricted opening jars (tecomates) also appear regularly in both slipped and coarseware vessels.

Mamom ceramics, including Escoba and Jenny Creek, display more uniformity in most modes than the preceding period marked by Xe. Sabloff considers the Ceibal assemblage effectively identical to that at Uaxactún (Sabloff 1975:230). Slip colors for surface finished ceramics (Flores Waxy Wares as defined at Uaxactún) expand to include buffs, whites, creams, and red-oranges, though the tendency in Mamom phase materials is strongly towards lighter red or orange slip finishes (Smith and Gifford 1967:166). Incisions are more often pre-slip, enabling shallower markings but also deeper grooves and chamfering (Sabloff 1975:62). These waxy wares have very thick slips, and a variety of surface variations. It is within the mode of surface finish that there is the most diversity. This has been crucial for Middle Preclassic regional cross-comparison, in particular at Rancho Búfalo.

Chicanel ceramics, including Plancha and Cantutse, display another tier of high uniformity, and are considered crucial to the Late Preclassic Maya horizon that is accompanied by the increasingly uniformity in ceremonial architecture described in Chapter 4 (Aimers and Rice 2006; Freidel and Schele 1988; Hammond 1999; McAnany 2006). While there is a wide range of slip colors present in surface finished ceramics (Paso Caballo Wares as defined at Uaxactún) these are uniformly waxy with thinner slips, and red begins to dominate the assemblage, resulting in an ubiquitous Lowland presence of Sierra Red (Smith and Gifford 1967:167). Sierra Red often has a characteristic degradation of the thin slip layer, and the tendency to reveal a reddish firing of the paste that sustains the coloring (Sabloff 1975:77). Despite early uniformity, the final period of the Late Preclassic, a period defined by some as the Protoclassic (100 – 250 AD), marks the uneven introduction of new resist forms such as Usulutan black-on-orange, as well as the range of mammiform tetrapods and other characteristic forms which appear variably across locations (Demarest and Sharer 1982:811).

5.2.1 Type-Variety Analysis of the Preclassic Middle-Usumacinta Ceramics

Driven by the type-variety methodology, an ongoing question that has fueled interest in the Preclassic Usumacinta region relates to the introduction of Xe and Real ceramic complexes to Guatemalan centers of the Pasion river system, specifically Altar de Sacrificios and Ceibal. Xe is considered by some to be one of the first instances of clear Maya identity in the Lowland region, referred to as a possible Pre-Mamom Maya Horizon consisting also of Cunil, Eb and Swasey ceramics - heightening interest in where it may have come from (Cheetham 2007:21). Several potential places of origin have been suggested, including El Salvador, the Swasey Complex of Belize, and the Mixe-Zoque area including Highland Chiapas (Kosakowsky and Pring 1998). In models that argue for a western and southern origin, a likely conduit for the introduction would have been the Middle Usumacinta River Valley; a putative borderland space between the Olmec and Maya cultural groups, and one with a series of mountain passes and riverine conduits that may have facilitated the movement of peoples and ideas from the Pacific

Coast – perhaps originating as far south as El Salvador (Andrews 1990:9 ; Sabloff 1975:230; Sharer and Gifford 1970).

Sites in the Middle Usumacinta, however, have seldom yielded Preclassic ceramics in primary context, though as outlined in Chapter 4, there have been several hundred sherds found in sites including Piedras Negras, El Fideo and La Tecnica in Guatemala, and fill layers from Palenque and five nearby sites in Chiapas and Tabasco (Arroyave, et al. 2009; Bravo 2013; Escobedo and Houston 2001:530; Muñoz 2004). Despite the small quantity of available material, and the mixed contexts that limited the interpretive power of these collections, Rands established a basic typology for the Usumacinta (Rands 1969). His work at Trinidad alongside Sisson's work at the Chontalpa center or Tierra Blanca, were combined to create a complicated, but still opaque picture about the possible ethnic identity of Usumacinta peoples (Bravo 2005; Rands 2007).

Rands named three Preclassic ceramic complexes from his work: Chiuaan, Xot, and Chacibcan (Rands 1969, 1977). The Chiuaan and Xot complexes, contemporaneous with the Middle Preclassic, are known for a lack of waxy-ware sherds, and a general set of similarities to the Xe complex as well as broader traditions from Tabasco that emphasize unfinished and roughly post-slip incised tecomates (Andrews 1990:8). Chacibcan represents the first time that there is a major presence of waxy-wares, and a stronger influence from Mamom ceramics, which are more firmly correlated with the broader Maya area. While Rands initially suggested a Late Preclassic date, he revised this to the late portion of the Middle Preclassic (Rands 1977). For the Chiuaan, he made an assertion of Olmec influence in the Middle Usumacinta fueling much of the speculation about possible Gulf Coast import in the introduction of Xe to the Pasion river system.

This same dataset was revisited by Englehardt to explore broader ethnic affiliations in the Late Preclassic (Englehardt 2010). His comparative work in the ceramic in the Usumacinta area during this later phase demonstrates its persistent role as both a conduit and receiver of external ceramic influences, but he suggests a firmly Maya identity in the region, and limited influence from the Grijalva basin or Chiapa de Corzo (Englehardt 2010:62). These datasets can be further contextualized by the analysis of several hundred diagnostic Middle and Late Preclassic sherds found in Piedras Negras. Griselda Perez Robles was able to analyze these materials and correlate them with Mamom and Chicanel sphere ceramics found in the Uaxactún typology (Pérez Robles 2006). This fits extant models for a progressive Westward expansion for Maya ethnolinguistic identity through the Preclassic, which manifests in the establishment of clearly Classic Maya centers like Comacalco, Tabasco, and the consolidation of Maya states in the Early Classic (Golden and Scherer 2013; Golden, et al. 2005; Kingsley, et al. 2012). The ethnolinguistic frontier between Mayan and Mixe-Zoquean groups that emerged after their founding persisted to the time of Spanish contact and into the modern day (Figure 5.2).

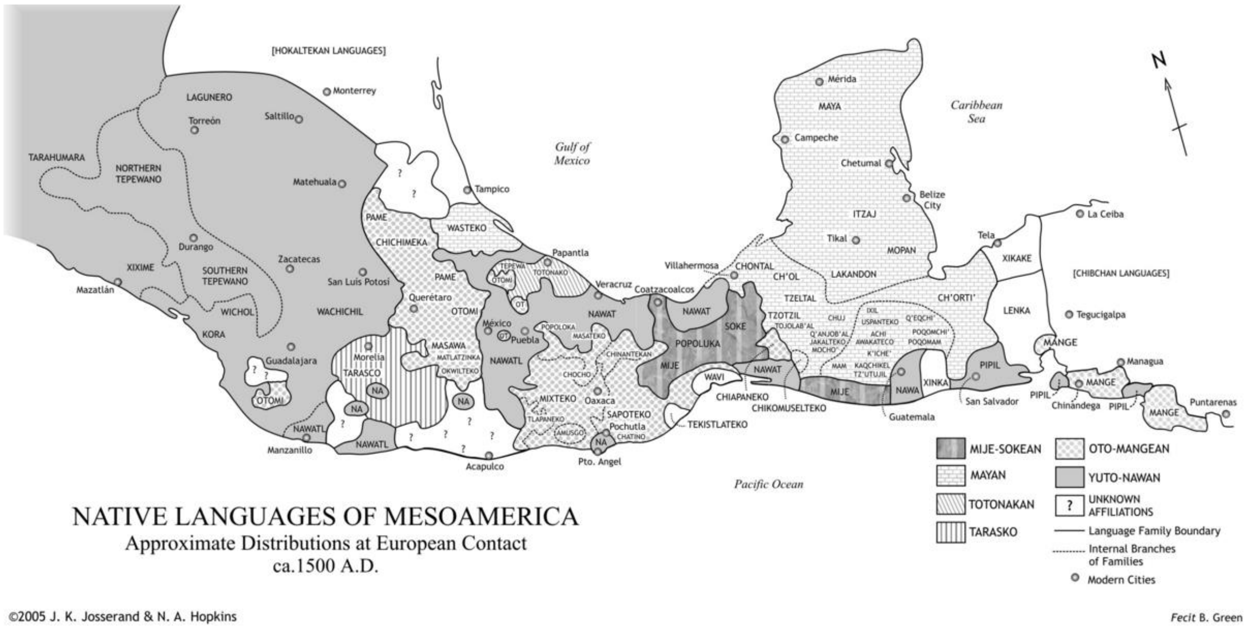


Figure 5.2 Mesoamerican Linguistic Map (N. Hopkins and K. Josserand 2005)

5.3 Ceramic Modal Analysis: Preclassic Slips and Forms at Rancho Búfalo

Excavations at Rancho Búfalo yielded thousands of well-preserved Preclassic sherds over the 2011-2013 field seasons. These were comprehensively analyzed at the Universidad Autonoma de Yucatán (UADY) from January to May 2014, to explore variation in forms and surface treatments, and tie them in to contextual variation and the overall site chronology. An analysis methodology was developed to study variation in forms and surface treatments of the site's ceramics. This, coupled with data from the excavations, was designed to determine how various traits and styles were introduced into the ceramic materials and the ways in which they were combined.

Over two thirds of the recovered ceramics date from the Middle and Late Preclassic periods, with later materials coming from surface excavations of Late Classic house foundations in the re-occupied site center. The laboratory at UADY, directed by Socorro Jimenez, has pioneered innovative studies of ceramic paste and the effective use of petrography and mineralogy in ceramic studies (Jeménez Álvarez 2012). For the Classic Period, analysis of Rancho Búfalo's ceramics and that from other PABC sites relied on fabric analysis, using the approximately 40 paste classifications they have developed. That diversity, and the site-specific origin of many of these pastes, allows site-specific affiliations to be asserted, such as associating Fine Grey with Palenque and Fine Orange with the Tabasco Coast (Aimers 2014; Rathje and Sabloff 1973:227; Sosa, et al. 2014:226).

During the Preclassic period, the diversity of pastes is lower, with five varieties representing nearly all of the assemblage (Sabloff 1975:30). It is variable firing, as opposed to different pastes, that drives fabric variability (Ancona Aragón 2012). This means the paste system pioneered by the Jimenez lab could not be applied to the ceramic analysis for the Preclassic Usumacinta. However, given the uniformity in the Maya area that had been noted in the Mamom and Chicanel spheres, a simple application of type variety to confirm already presumed ethnic identities seemed insufficient as well (Smith 1979). Other recent scholarship on Preclassic Maya ceramics has innovated the use quantitative approaches to study changes through time to vessel size, but these have continued to depend upon the type variety system in an effort to streamline analyses (Callaghan 2013).

However, slips are diverse during this period, and can directly reflect intentionality of producers as opposed to the frequently environmentally constrained choices in the use of pastes or tempers. During the Preclassic "It is the slips that most readily allow one to place this complex with its closest relatives" (Andrews 1990:2). With this in mind, and noting the success that Jimenez had in applying the most diverse Classic period property (paste) to later assemblages, a similar modal methodology was used to study the Rancho Búfalo's Preclassic ceramics – but driven by the analysis of surface finish, not ceramic fabric. This attribute, being shared across a number of Preclassic assemblages but not quantiatively explored, represented an opportunity for formal analysis with utility beyond outright classification into a standing system (Cowgill 1990:73).

Starting with surface finish technology, the Rancho Búfalo ceramic analysis relied on three additional nested ceramic attributes: color, form and decoration. This database of values is in Table B.1. Intact rims were separated and subjected to two additional qualitative criteria (rim form, lip form) as well as quantitative measures of rim diameter, and vessel height (when complete). This database of values is in Table B.2. Sabloff's table of ceramic attributes as established at Ceibal was utilized to establish the "codes" used in each of these tiers of categorization, but types and varieties were not sought. In this way, rather than rely on already extant typologies, it was possible to classify Rancho Búfalo materials within their own set of meaningful criteria. In addition to this dataset, pieces were considered for refinement and form of individual ceramic sherds; anything unusual was marked "diagnostic" to be documented, drawn, and analyzed separately. Iconographic examples explored in the second half of this chapter come from this set of materials.

5.3.1 Rancho Búfalo Vessel Forms

Most of the Preclassic ceramics recovered from Rancho Búfalo fit within the Lowland Maya Mamom and Chicanel spheres first defined at Uaxactún, and refined through later and ongoing research at sites including Altar de Sacrificios, Ceibal, and Barton Ramie (Adams 1971; Gifford 1976; Inomata, et al. 2014; Sabloff 1975; Smith 1955). Through initial field typing, and the first round of material analysis, the site was confirmed as being Preclassic in date (Jeménez Álvarez, et al. 2011:85). While there is moderate engagement with Gulf Coast ceramic traditions in the Rancho Búfalo assemblage, connections with the Southern Maya Lowlands of neighboring Petén shone through most clearly.

A diagnostic Middle Formative vessel form that appears regularly across Formative centers within the Mesoamerican "World Civilization" are tecomates. These are narrow mouth restricted-orifice vessels with a generally skewmorphic forms resembling gourds (Willey, et al. 1967:293). They are widespread throughout the Early Formative ceramic assemblages in Mesoamerica, but largely disappear by the Late Formative – a change suggested by some to correlate to their utility for mobile groups (Arnold 1999:158). Early tecomates may have been used primarily in food preparation; vessels in which heated rocks could have been placed to steam foods or they could have been covered to store it (Rosenswig 2007:14). In later periods, thin walled, “fancy” tecomates could have been highly decorated, and tend to be much smaller and usable for the serving of foods or liquids like alcohols (Rosenswig 2007:17). Several Early Formative tecomates at Paso de la Amada, an site with some of the earliest ceremonial ballcourts in Mesoamerica, tested positive for the presence of cacao (Powis, et al. 2007) (Figure 5.3).

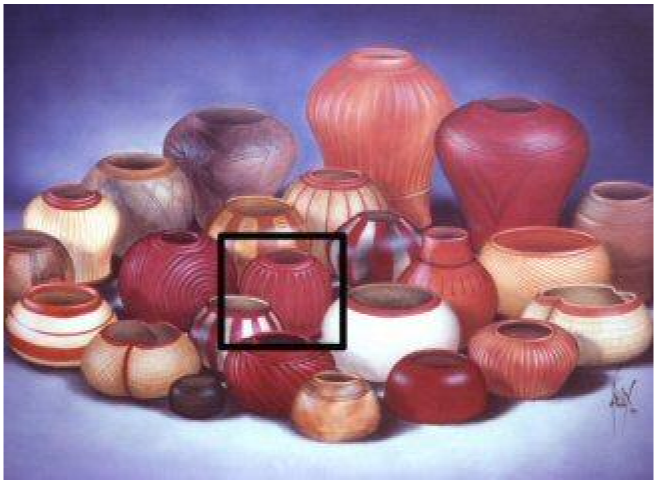


Figure 5.3 Tecomates from Paso de la Amada, drawing by Ajax Morano (Powis, et al. 2007)

Rands notes in his typology that an Olmec-style Tecomate with impressions appears at Trinidiad, Tabasco in the Chiuaan phase, but then they later become commonplace in slipped forms that are characteristically Maya in later period (Rands 1969:6-9). This is similar to an early fragmentary example from Rancho Búfalo (Figure 5.4). However, most of the Rancho Búfalo tecomates are in both form and surface finish in line with examples from the Maya area. There is regional variation in their presence as well; they are well represented at Altar de Sacrificios, but comparatively absent at Ceibal. Their presence at Rancho Búfalo, then, may represent influence from Chiapas, or a broader connectivity between Usumacinta centers, and broadly mirrors the chronology established by Rands.

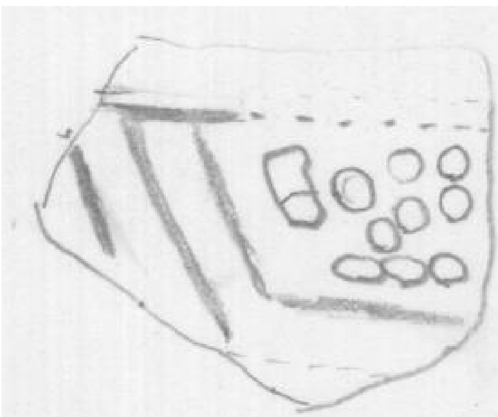
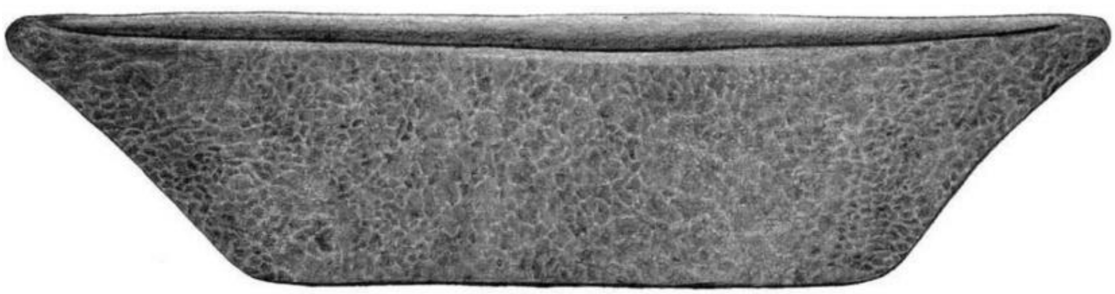
a.  b. 

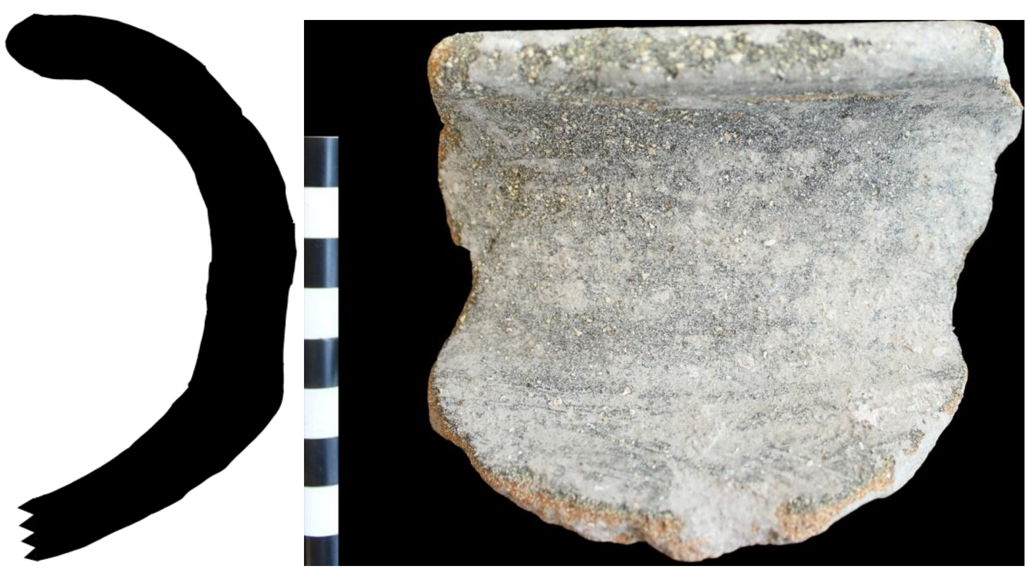
Figure 5.4 Rancho Búfalo unslipped Tecomate (993A) a. drawing b. photo (J. Dobereiner)

Rim forms on vessels other than tecomates are in line with expectations for the Preclassic. Outflared, everted rims and wide plates, which are common in both Olmec and Maya region during the Middle Preclassic, dominate the assemblage of early diagnostic slipped sherds at Rancho Búfalo (Figure 5.5a, b). Within the assemblage of large, unslipped, jars, neck length and size of the rim is known to become lesser and more direct through time, at Rancho Búfalo they conform entirely with expectations for a site which is largely Middle and Late Preclassic in date (Figure 5.5c). A wider range of forms appears entering the Late Preclassic. Generally they conform to Chicanel expectations, though there is little in the way of Protoclassic materials. No mammiform tetrapods were found at the site. One of the few examples of a clearly Protoclassic vessel is the large diameter inverted-rim dish found in the north of the site (Figure 5.6c). Overall, the vessels are typical for the Preclassic Maya region, and the revised methodology does not lead to dramatically different outcomes in the interpretation or meanings behind vessel forms.

a.



b.

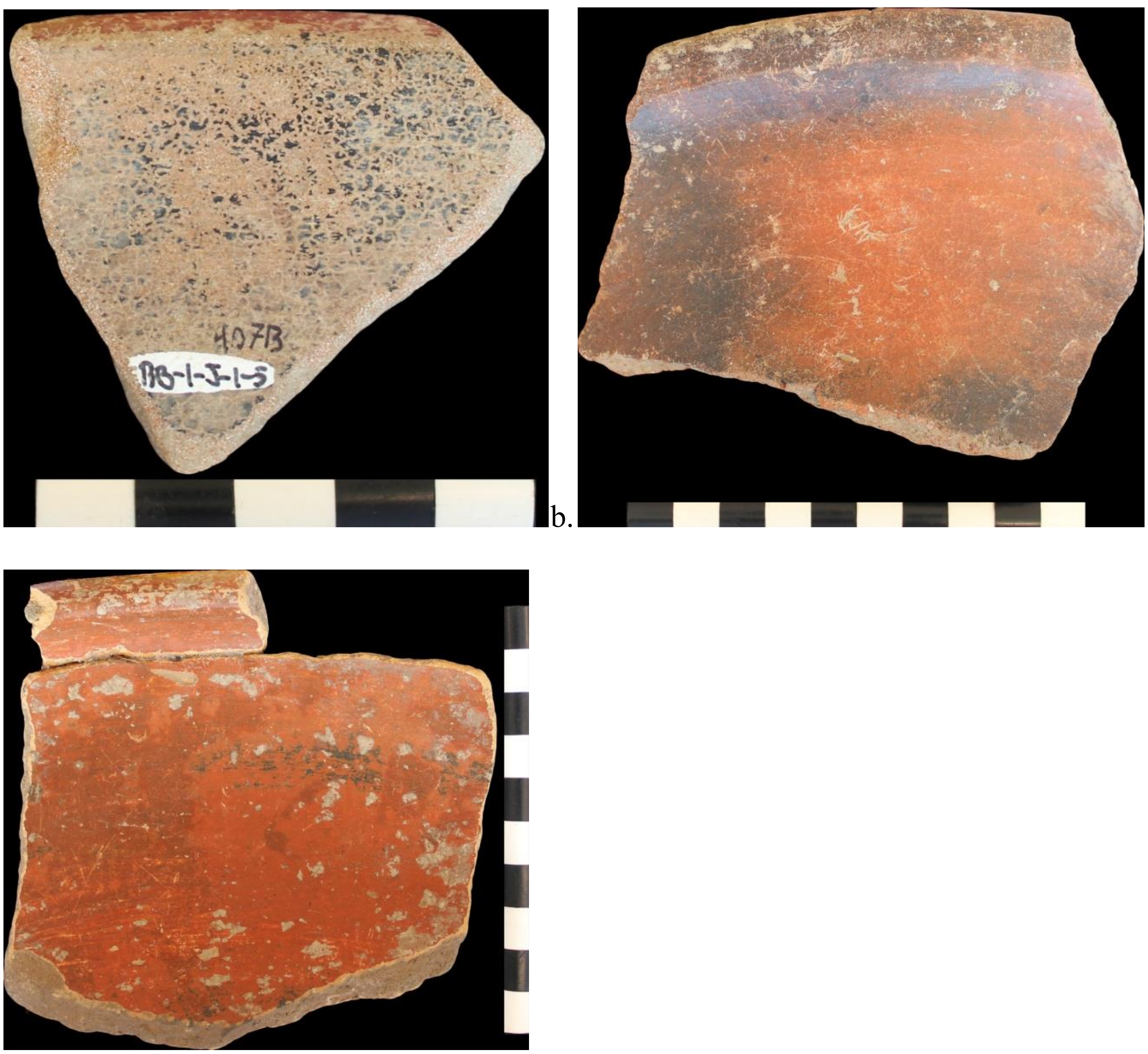


c.

Figure 5.5 Rancho Búfalo Sherds and Rims. a. Everted plate rim (0383) b. shallow dish (cajete) reconstruction (0604). c. Preclassic long-necked unslipped jar (3027A). (Renderings by Belem Alejandra Ceballos Casanova, Profile by Fernando Escamilla, Photo by J. Dobereiner)

5.3.2 Rancho Búfalo Slips: Pushing back the date on Yucatán connections to the Gulf Coast

For slips, however, the modal analysis focusing on surface leads to more useful results than a standard type-variety analysis could accomplish. The Rancho Búfalo assemblage had a variable series of slip outcomes (Table 5.1). A large proportion of the materials are mottled or crazed, with very few uniform finishes in this early period (Figure 5.6). This level of detail is typically not available; while there are qualitative notes within type descriptions about the presence of in other ceramic reports, materials are separated type and variety only.



a. b. c.

Figure 5.6 Surface finish examples within waxy slips: a. crazed (407B) b. mottled (209A) c. streaky, inverted-rim, Protoclassic dish (3161A) (J. Dobereiner)

Table 5.1 Preclassic Rancho Búfalo Ceramic surface finishes by technology (n=8476)

	Waxy	Crazed	Mottled	Streaky
Counts	7369	216	888	3
Percentage	86.9%	2.6%	10.5%	0%

The differences in surface finish are most pronounced during the Middle Preclassic, when waxy wares become commonplace in the Preclassic Maya area, making it a particularly useful dataset for analysis. These thick slips, so-called because of the "waxy" feeling on rubbing, were often very thick, and variably fired. Their production style led to a wide variety in final visual forms, including such properties as: crazing (a series of spider-web cracks caused by shrinkage of slip over a static surface), mottling (dark and light areas with smudging, multiple colors, and unpatterned clouds from variable firing) and streaky finishes (linear uneven coloring across the surface) (Andrews 1989:25). There is regional variation in how these surface finishes manifest themselves, particularly among Mamom waxy wares. Similarly, the presence of coloration can vary between regions. This is particularly the case in Yucatán; "The Middle Formative Komchen potters purposefully and often combined cream, buff, tan, red, orange brown, and black on the same vessel" (Andrews 1989:13).

Of Preclassic assemblages, the Rancho Búfalo assemblage is most evocative of Komchen, Yucatán (Table 5.1). While quantitative data is available exclusively from Rancho Búfalo at this point, in Yucatán there is a comparatively frequent presence of mottled, and to a lesser extent crazed, ceramic surfaces during the Middle Preclassic, especially in Chunhinta Blacks, which then look similar to Bakxoc Black-and-cream-to-buff and cream-to buff Dzudzuquil (Andrews 1989:5). Most often this coloring represents the agentive and controlled use of firing for decorative purposes. This is in contrast to Petén sites such as Ceibal and Uaxactún, where, while not quantified, uniform surfaces are more common. There is limited crazing, and bichrome surfaces tend to appear in only cream and blackwares – not extended to involve Juventud Reds (Sabloff 1975:69). It is in particular intriguing given the architectural resonance between Rancho Búfalo structure D6-5, Structure XXVIII at Becán, Campeche and Structure no. 450, Komchen, Yucatán.

Rancho Búfalo's ceramics in most ways are similar to "local" assemblages from Petén. Microvarations exist, including the presence of specular red slips at Rancho Búfalo which are present at sites like Holmul, but totally absent from Tikal (Nina Neivens, personal communication 2012). But the strongest similarity within the site’s overall forms and surface treatments outside Petén are with materials from the Northern Maya Lowlands - not neighboring traditions from the Pacific Coast or Gulf Coast. In surface treatment the most common non-local traits which were integrated into ceramic production at Rancho Búfalo were from this distant region, one that could only be accessed by travel through the southern Maya Lowlands, or through coastal travel along the Gulf of Mexico.

There have been early hints about the connections between the Gulf Coast and Northern Lowlands, in particular a series of Olmec-style jades found in Cacskinkin, Yucatán (Andrews 1986). However, their connectivity is most often discussed in the context of later periods, in particular iconographically driven-narratives of Yucatecan interest in Epiclassic Petén, though scholars have grown hesitant to assert either “Putun Tabasco Trader incursion” or “Central Mexican and Yucatecan warrior class” (Kowalski 1989). Yet, alongside continuing questions of the similarities between Tula, Hidalgo and Chichen Itza, incremental evidence has started to point towards deep-time interaction between Yucatán and Tabasco, and extended interregionalism in other periods (Jones 1995). Direct evidence of intellectual and interpersonal exchange comes from architectural lines of evidence (Andrews 1974). These require a higher degree of contact, and cannot simply be produced by down-the-line movement of trade-wares. Notable similarities in architectural techniques include the use of mud-mortar in Early Classic phases in both Palenque, Chiapas and Dzibalchultun, Yucatán (Andrews 1974:139). In later phases, there are notable similarities in the design of the Temple of the Seven Dolls and the Palatial Complex at the Palenque acropolis (Andrews 1974:139). More broadly, stucco work and architectural techniques such as concreted cored stone veneer, and inlaid stone mosaic architecture which are found in Epiclassic Yucatán may have their origin in Palenque, Chiapas and Tabascan sites (Andrews 1974:143; Ball 1974:87).

Building on architectural models of interaction, indicators of exchange between the Classic and Postclassic Western Maya Area and the Northern Maya Lowlands been driven by ceramics, specifically “Fine Gray” and “Fine Orange” materials (Andrews, et al. 1984; Jeménez Álvarez 2012; Kepecs 1998; Smith 1958). Both of these types have chemically derived compositions that demonstrate origin in the Usumacinta River Valley (Bishop, et al. 2012; Smith 1958). During transformations surrounding the Epi-Classic period, they were traded out of an origin port at the end of the Usumacinta River Valley around coastal Campeche and costal Tabasco, to be found in contexts ranging from coastal Oaxaca to Cozumel, Quintana Roo (Webb 1974:362). A particularly high concentration was found over an extended chronological span in Western Yucatán, beginning with Tepeu 2 (ca. AD 700) Fine Orange Z and Fine Gray finds at Dzibalchultun (Andrews 1974:144). Finds of these materials reach their apogee with Fine Orange X (Silho) finds at Chichen Itza, Isla Cerritos, and coastal Yucatecan sites throughout their Postclassic ceramic assemblages (Jeménez Álvarez 2012; Kepecs 1998; Rathje and Sabloff 1973:227). Rancho Búfalo's diverse slips hint that this connection to the Northern Maya Lowlands may have started earlier than has been previously attested.

5.4 Iconographic Analysis: Preclassic Writing and Visual Motifs

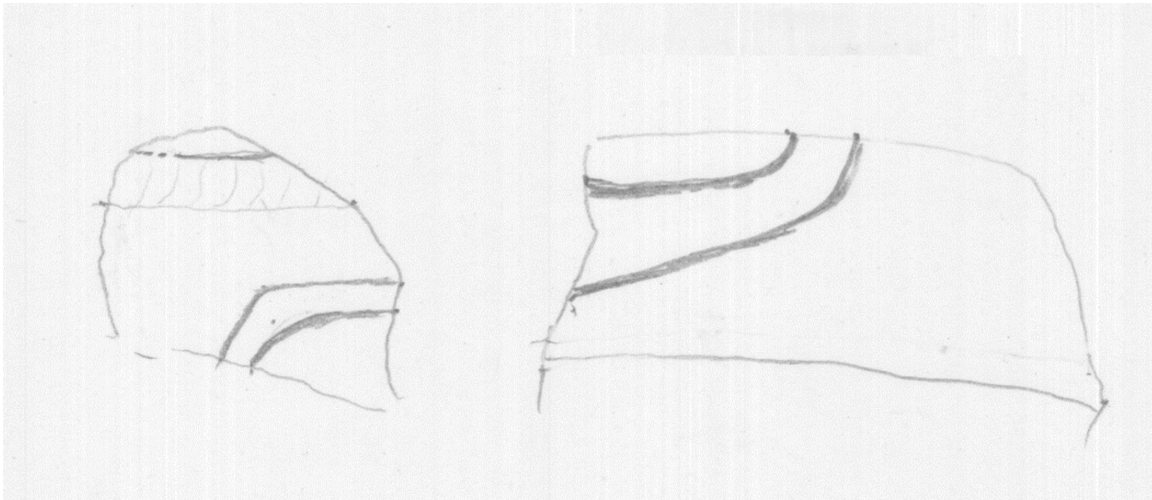
Forms, slips, and wares are ceramic modes that correlate with production of materials. They can be stylistic, but also constrained by material properties and available resources (Lechtman 1977). Ceramic design elements, in the form of incised, impressed, sculpted or painted visible surfaces represent a separate area of material development that is not strictly functional (Plog 1980). These could be used to mark a vessel in particular ways to give it more value in gifting, in ritual practice, or in signaling identity (Elson and Sherman 2007). In this way, iconography, graphemes, or patterns that are placed on a vessel offer a separate, more individualized, perspective on a given item.

At Rancho Búfalo, simple motifs occur with some frequently; this includes pre-firing modifications of the ceramic surface such as a simple incisions around the vessel circumference, criss-cross shallow raking (especially in Sapote Striated varieties of unslipped, coarseware, the Achiotes type, per Smith 1967:169), or bichromic slips, some presence of which has been documented in approximately 10% of sherds. More dynamic surface decoration only occurs in 45 examples, defined here as multiple non-circumferential incision, circumferential incisions that intercept the rim, or plastic surface modification (Sabloff 1975:27). Of particular note are celestial motifs that have Gulf Coast connections, several diagnostic Maya styles, and a single example of possible writing with Isthmian influence (Lesure 2000). This diversity of decorative and iconographic forms demonstrates influence connections with more than one region, but more broadly, demonstrates the dynamic uptake of forms and simultaneous use of both Pan-Mesoamerican and region-specific iconographic canon at Rancho Búfalo, emphasizing the presence of multiple influences among residents of this strategically located center.

5.4.1 Olmec Celestial Motifs at Rancho Búfalo

Two major motifs believed to have Olmec origins that spread throughout the Maya area during the Preclassic period are double line breaks, and the cross-banded motifs. Both are thought to have had celestial connotations, and relate to the cosmos; one of the most central aspects of Mesoamerican belief (Carrasco 1990:90). Whereas the double-line break sherds have forms and slips that are characteristic of the Rancho Búfalo assemblage, the cross-banded motif sherd form is unusual and evocative of the early gray-wares known from Chiapa de Corzo.

Four sherds found at Rancho Búfalo have motifs that are reminiscent of the double-line break, a design element that became commonplace in Formative Mesoamerica (Figure 5.7). They are composed of a pair of lines that follow the circumference of the vessel rim, and typically arc one or several times to the boundary of the rim (Andrews 1990:7). This incised motif in which parallel lines turn up or down at intervals" occurs most frequently along Formative Ceramic vessels (Flannery and Marcus 2000:24). This design element is strongly associated with the Olmec, and was found in substantial quantities in La Venta ceramics (Drucker 1959).

a. 

b. 

Figure 5.7 Rancho Búfalo Double Line Break Examples (3101A and 3018A) (a) drawings (b) photographs (J. Dobereiner)

Outside of the traditional Olmec region, it appears in materials at La Victoria, Guatemala in nearly the same form, leading Michael Coe to assert Olmec influence along the Pacific Coast (Coe 1961). Since then, double-line break motifs have been found extending throughout much of Mesoamerica in varied forms. However, while it appears across the Pacific Coast, Maya Highlands, and many Lowland sites, its presence is uneven; it is common at Altar de Sacrificios, but comparative rare at Ceibal (Andrews 1990:8). It is also absent from the majority of Middle Preclassic Belizean sites, outside of Cuello (Kosakowsky 1987:90). Entering the Late Preclassic, some 400 years after the initial appearance at Ceibal, double line breaks are finally found extending into Belize and Yucatán in large quantities. By this point, the frequency of their appearance is greatly reduced in the Olmec Heartland and Coastal Chiapas.

The double-line break has been generally associated with Olmec influence based on its earliest presence in the Mixe-Zoque associated San Lorenzo D Nacaste Phase, and in the Early Formative Central Chiapas Depression (Coe and Diehl 1980:198; Rosenswig 2010:225). The specifics of this origin have been debated, however. Kent Flannery and Joyce Marcus have asserted that the earliest instance of the double-line break occurred in Oaxaca, and that it is Central Mexican in origin (Flannery and Marcus 2000). It does not appear beyond the far western extent of the Maya area for an extended period of time, however. In general, especially due to its relative absence from Early Preclassic Maya contexts in Belize, this design element is most often treated in the Maya area as a marker of contact or influence from the west (Andrews 1990:8)

While the chronology of its appearance and spread is generally understood, the symbolism of this abstract motif remains under debate. Its position at the top of vessels, and its similarity to the inverted U's known from skybands, have led Karl Taube to suggest it is associated with celestial imagery (Taube 1995:92). This celestial or supernatural interpretation is generally accepted, however, Robert Rosenswig argues that it is a variation on the cleft motif, and a marker of maize and agricultural connotations (2010:226). Either interpretation ties it directly to western variants of the emergent Mesoamerican "World Civilization;" a theme that runs thought much of the Middle Formative iconography found at the site.

5.4.1.1 Skyband Sherd

A single sherd found at Rancho Búfalo with an incised cross-banded design is evocative of Olmec representations of a pattern known as the skyband (Figure 5.8). Various forms of the cross-banded motif appear in Mesoamerican art from the Early Formative, where they are used to represent sky in a series of ceramic roller seals from highland Puebla (Taube 1995:86). Starting in the Middle Preclassic, crossed-bands are understood to be used by the Olmec to represent the linked concepts of sky and serpent; an ideas that is manifested in the feathered serpent that serves a role in over 2000 years of Mesoamerican art (Coe and Thacher 1966:12; Taube 1995:86-87). The cross-banded motif itself continues to be used as a symbol with celestial connotations in modern Tzeltal Maya communities of Chiapas (Hayden 2003:8). While the crossed-bands appear throughout Mesoamerican art, the example from Rancho Búfalo matches most closely with its appearance on forms like La Venta Monument 19 and incised greenstone representations that originate from the Olmec Gulf coast.

a. b.

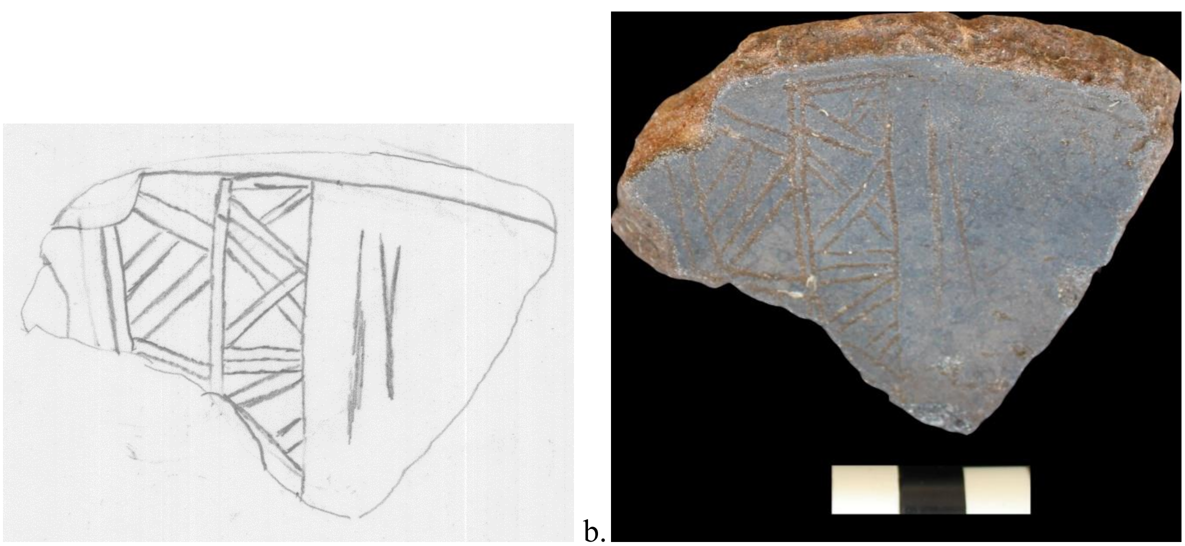


Figure 5.8 Skyband sherd (638) (a) design motif sketch (b) photograph (J. Dobereiner)

Crossed-band forms become prolific in the corpus at La Venta, appearing both in monumental art and in portable, greenstone objects. The representations appear in three context in Olmec representation, though the actual form of the crossed element is consistent across them. In the first, it appears as a framing device or skyband, most notably on La Venta Monument 19 (Taube 1995; 2004b:39 fig. 20a). In the second, it appears as a component of a headband or belt, integrating both the celestial power of the framing band, but also offering a representation of weaving or textile, as on La Venta Monument 25/26 (Reilly 1995:36; Taube 2004:38 fig.19d; Taube 1995). In its third context, it appears in the eyes, ears, or mouth of divine entities, representing a portal to other spaces, or celestial connotations of the being, as on the Tres Zapotes Stela D and Izapa Stela A (Reilly 1995:36; Rice 2007:93).

During the Late Preclassic, representations of the skyband continue to occur, but in a subset of the above circumstances. They are prevalent in monumental art at sites like Izapa, Chiapa de Corzo, and San Bartolo, but they are represented by "double merlons, diagonal bands and inverted-U gumbrackets" – never by the crossed-bands (Kappelman and Reilly 2001:41). Merlons, diagonal lines, and inverted-U's do have precedent on Olmec skybands alongside crossed bands, on monuments such as La Venta Altar 4, and the reasons behind the cross-band's exclusion on skybands outside the Olmec area are unclear (Kappelman 2004:100; Saturno, et al. 2005; Taube 1995:91). They continue to be used as infixes on clothing, such as on the Protoclassic Dumbarton Oaks Plaque and Tres Zapotes Stela A (Coe 1977; Taube 2004b:97 fig 46f). They are also used as infixes that represent celestial connectivity on eyes and mouths, such as on Mask One at Cival, (Estrada-Belli 2006). In these cases, however, a single cross-band is represented, and they are not integrated into a larger symbolic assemblage.

It is only during the Classic Period that the crossed-band motif returns to have a role in skybands. In Maya representations of this time period, celestial bands become a common design element, especially in benches and thrones. These skybands have a different composition than their counterparts from the Preclassic, and instead of a single continuous unit, "the symbol for sky is a band divided into compartments by vertical bars. Each compartment is filled by the symbol for a particular star, constellation or planet" (Schele, et al. 1986:47). The cross-band itself, in the Classic tied directly to celestial motifs and its relationship to quadripartite *k'in* signs, is catalogued by Thompson as hieroglyph t552 (Robertson 1974:78). The hieroglyph t552 is understood, among its logographic and syllabic meanings, to represent sky (Houston 2001:164). It is this textual mode that the crossed-band motif is infixed into single cartouches of Classic Maya Skybands, as opposed to the more fluid and less bounded form found among the Preclassic Olmec.

Based on its form, the Rancho Búfalo crossed-band and associated forms fall more in line with the corpus known from the Olmec area. The cross itself is one aspect of a broader composition with a series of diagonal lines. While bounded by a double line on one side, the other side of the cross motif has a single independent diagonal line. Unusually, there is a second register parallel to the band containing the cross motif. This does not appear in any of the known abstract sky-representations from Olmec contexts, but is evocative of the series of layered belts that appear in La Venta Monument 25/26. The independent angled lines themselves are similar to several representations of maize known from the Olmec corpus, though those tend to be delimited by a broader form (Taube 2004b:38).

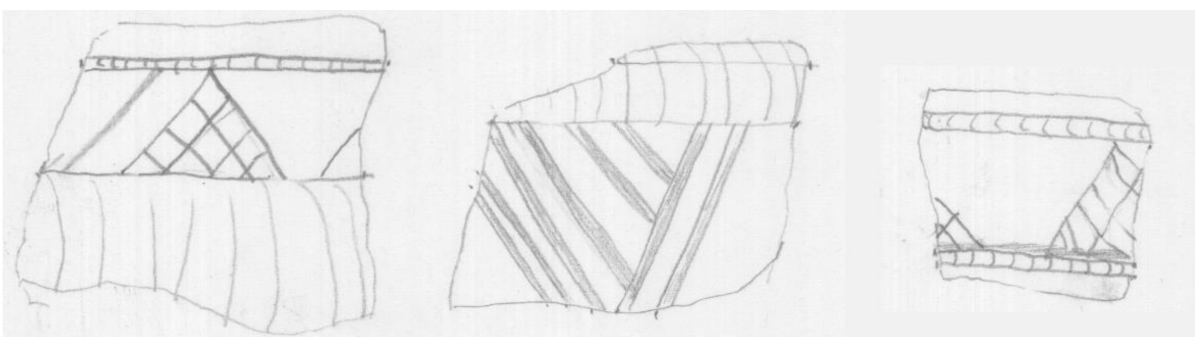
The fabric and form of the ceramic can also be used to argue for a western or non-Maya origin for this piece. The grey fabric differs from other pastes known from the Preclassic Maya area, and it is not similar to other pieces that have been recovered from Rancho Búfalo. The paste is most similar to examples in the New World Archaeological Foundation collection that were observed by the author to date from Chiapa de Corzo Francesa phase or earlier. On the obverse from the symbolic carving, there are a series of striations that are rounded and in line with the production of the piece. These do not appear elsewhere in the Rancho Búfalo corpus, nor in the Maya lowlands. Finally, the form of the vessel is very unusual. While only a fragment of the base remains, it can be seen that its robust form contrasts markedly with the highly tapered and narrowed form of its walls. The overall shape of this dish is unknown.

5.4.2 Preclassic Maya Ritual Ceramics

While there are few pieces with clear iconography at Rancho Búfalo, there are a handful of examples alongside the Olmec-style examples described above which conform in some way with broader expecatations of Maya style ceramic vessels. The site presents little that differs dramatically from other known examples in the Maya Lowlands, and no clear hybridity or innovation in these material forms. However, a pair of noteworthy diagnostic forms can illustrate this uniformity. Both come from the northern ceremonial precinct of Rancho Búfalo. They may be indicative of the ritually crucial ceramics developed and for the purposes of elite ritual and gift exchange (Tokovinine 2016).

One is the majority of a largely intact vessel found directly to the west of tomb structure D5-3 (Figure 5.9). It has deep post-slip gouges on the side in triangular forms, and an everted rim that is evocative of other Middle Preclassic materials. The triangular forms themselves are very commonplace across a broader range of materials at Rancho Búfalo, most dating to later phases (Figure 5.10). The offering vessel, given its location, highly decorated form, and rim diameter, fits with Holmul derived models for the public use of ritually decorated ceramics in comparatively private plaza rituals, such as competitive elite or diacritical feasting (Callaghan 2013:335). It may also have been an offering for a disturbed burial found nearby.

Figure 5.9 Mamom period gouged serving vessel reconstruction (Belem Alejandra Ceballos Casanova)

a.


b.


Figure 5.10 Triangular Design Element Examples at Rancho Búfalo (1190A, 3053A, 2726A) (J. Dobereiner)

A second selected example, the handle to an effigy lid vessel in the form of a bird head (Figure 5.11), dates from later. This motif is particularly common in Late Preclassic and Early Classic Maya ceramics, including a series of examples from Holmul currently in the Peabody Museum (Callaghan 2013:325). This also is a possible piece used in ceremonial contexts, and diacritical feasts of the type described above.

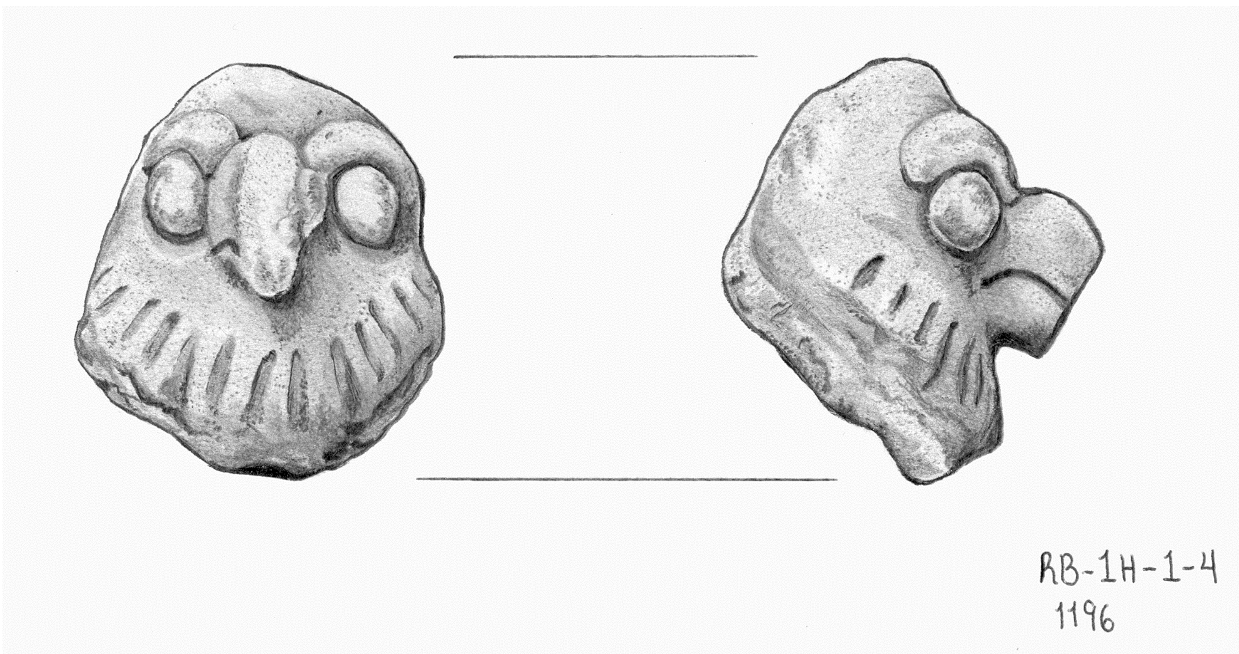


Figure 5.11 Bird head rendering (Belem Alejandra Ceballos Casanova)

5.4.3 Possible Writing at Rancho Búfalo

Western or Mixe-Zoque contact is also indicated in the form of possible graphemes found on a Middle Preclassic sherd at Rancho Búfalo. While the origins of Mesoamerican writing remain poorly understood, similarities in form, calendrics, and numeration have long hinted at interaction between script traditions (Campbell and Kaufman 1976; Coe 1976; Justeson 1986; Marcus 1976; Mora-Marín 2001). More recently, Lacadena (2010) has interpreted polyphonic, innovated digraphonic and acrophonic signs in Classic Maya hieroglyphs as indicative of Mixe-

Zoquean borrowing in their development. This may link the Maya writing system with the western, Isthmian tradition known most famously from the Late Preclassic Tuxtla Statuette and La Mojarra Stela (Coe 1976; Holmes 1907; Justeson and Kaufman 2008:188; Méluzin 1995). Parallel to this historical linguistic research, are intermittent examples of possible early writing found archaeologically (Figure 5.12). The rarity of early texts makes any such new finds of importance in refining this narrative. The early use of hieroglyphic-inspired designs in an intermediate location like Rancho Búfalo suggests a central role for interregionalism in the emergence of Mesoamerican scribal traditions.

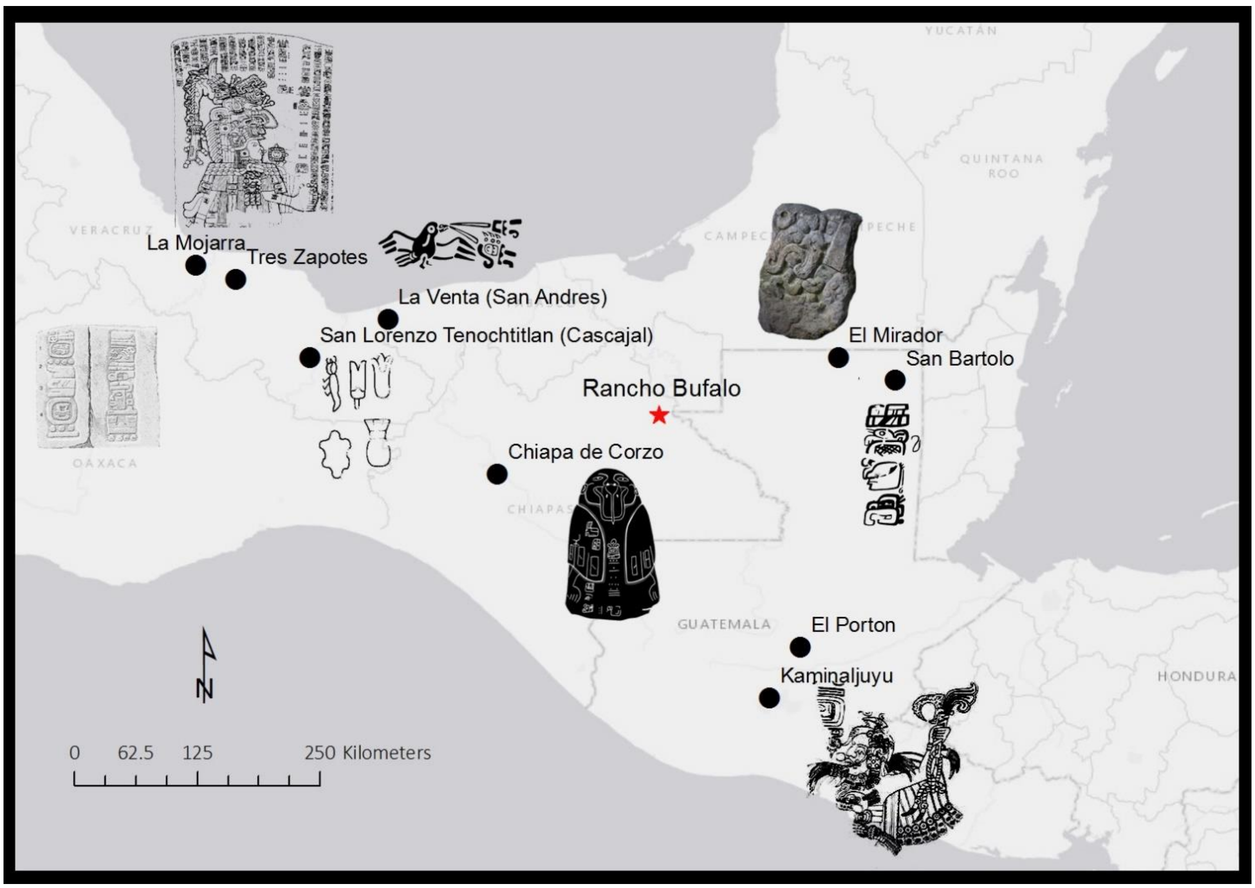


Figure 5.12 Map showing selected sites where Preclassic Mesoamerican writing has been found (J. Dobereiner)

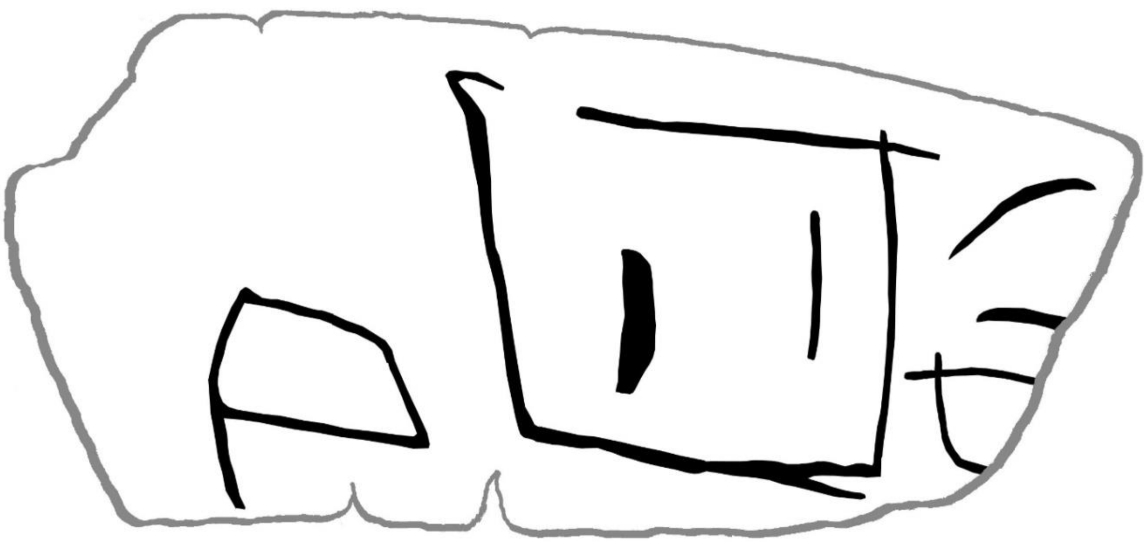
The hieroglyphic blocks of La Venta Monument 13 and the recent find of a glyphic cylinder seal at San Andrés, La Venta dated to 650 BC provide some archaeological support for a possible Gulf Coast origin of the script tradition (Coe 1976:111; Pohl, et al. 2002). Isthmian script itself, while best known from Late Preclassic examples such as the La Mojarra Stela and the Tuxtla Statuette, also has recognizable early examples such as a sherd found at Chiapa de Corzo (Lowe 1977). The recently discovered Cascajal block also furthers the possibility that the Olmec region was a likely source of the Mesoamerican scribal tradition. This small serpentine stone is incised with sixty-two signs, and has been tentatively dated to 900 BC through iconography and associated ceramics, placing it at the forefront of candidates for Mesoamerican writing (Ma. del Carmen Rodríguez, et al. 2006:1611). While there is no clear relationship between these signs and the more familiar glyphic tradition of the Isthmian and Maya traditions, it does indicate the use of regularized and standardized signs, plausibly for the ritual or quotidian purposes most often associated with early writing traditions around the world (Li, et al. 2003; Postgate, et al. 1995).

Early writing in the Maya area is documented most clearly at San Bartolo, Guatemala in the form of a stuccos painted with Preclassic Maya hieroglyphs from Las Pinturas sub-V (Saturno, et al. 2006). Using C14 dates from surrounding fill from above and below the find, this instance of early Maya writing has been dated to BC 300-200 (Saturno, et al. 2006:1281). Alongside a handful of finds in Maya Lowlands sites, the largest corpus of hieroglyphs known from this time period comes from the Southern Maya Area, especially on carved stone monuments from Kaminaljuyu, Guatemala (Mora-Marín 2005). No materials have previously been documented from the space between the traditionally defined Preclassic Maya and Olmec region. The Rancho Búfalo sherd, as one of the first pieces with possible graphemes from within this region, represents an important tool for exploring possible ethnolinguistic identities in the Usumacinta corridor.

5.4.3.1 Rancho Búfalo Grapheme Sherd

The designs on the Rancho Búfalo sherd were produced with wide, post-slip incisions (Figure 5.13, Figure 5.14). Three graphemes or partial graphemes are present, with only the single central example preserved in its entirety. This complete character is defined by a rectangle that fully encloses two half-height verticals strokes. To the right of the complete sign is the left half of a grapheme composed of a half-height longitudinally divided circle, with an additional curved stroke above it. A small polygon less than one quarter the height of a full character appears on the left of the sherd. The sherd itself is a portion of the rim and descending wall of a 17 cm diameter bowl. The incisions seem likely to have continued around the entire circumference of the vessel, and may also have extended to additional registers below the rim, integrating the entire vessel surface into a larger composition. However, as no additional fragments were found, this is necessary speculative.

a.



b.

Figure 5.13 Rancho Búfalo Sherd (a) Photograph and (b) schematic grapheme rendering drawing (J. Dobereiner)

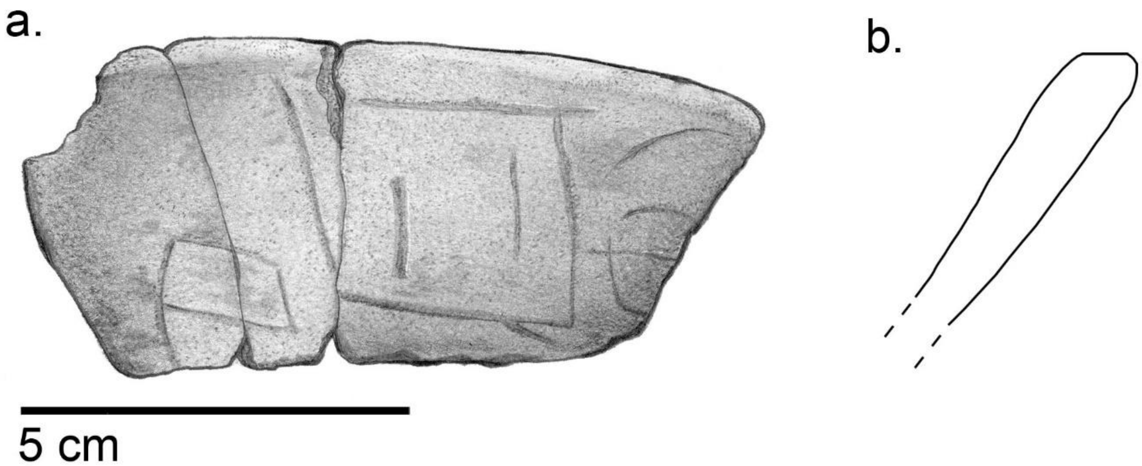


Figure 5.14 (a) Rendering of Rancho Búfalo sherd (Belem Alejandra Ceballos Casanova), (b) Rim profile of Rancho Búfalo sherd (Fernando Escamilla, Jeffrey Dobereiner)

Though there are too few graphemes to seek the patterning which would allow their definitive classification as writing, defined here as a visual system that encodes spoken language, these glyph-inspired forms can be usefully compared to other scribal traditions (Coe 1992:13). The three graphemes on the Rancho Búfalo sherd do not duplicate known Maya or Isthmian hieroglyphs, but they do conform to broader graphic conventions of Preclassic Mesoamerican writing. In execution, they most resemble Isthmian inscriptions such as that from the Tuxtla Statuette, which rely on simplified line incision, in contrast to the calligraphic origins of Maya glyphic forms (Coe and Van Stone 2001:95). Specifically, the designs tend toward the cursive appearance of the inscription on the Chiapa de Corzo sherd (Justeson and Kaufman 2008:160; Lowe 1977).

In form, the central grapheme on the Rancho Búfalo sherd shows similarities to the glyph *wʉ* in John Justeson and Terrance Kaufman's (2001:5) proposed Isthmian syllabary (personal communication, Alexandre Tokovinine 2015). The sign, representing the consonant *w* along with a Mixe-Zoquean vowel spelled as ʉ, is depicted as an inverted bracket enclosing two U-shaped brackets or strokes (Figure 5.15a) (personal communication, John Justeson 2015). While the U-shaped bracket has a frequent role in early Maya and Olmec iconography, the focus in the *wʉ* sign is instead on the use of matched element pairs, as indicated by the two-stroke and two-dot variants of this grapheme (Quirarte 1977). The central grapheme also resembles a sign which appears twice on the Cascajal Block, a rectangle similarly containing a matched pair of elements (Figure 5.15b). The other two signs on the Rancho Búfalo sherd, being incomplete, cannot be as effectively compared with known Mesoamerican signaries.

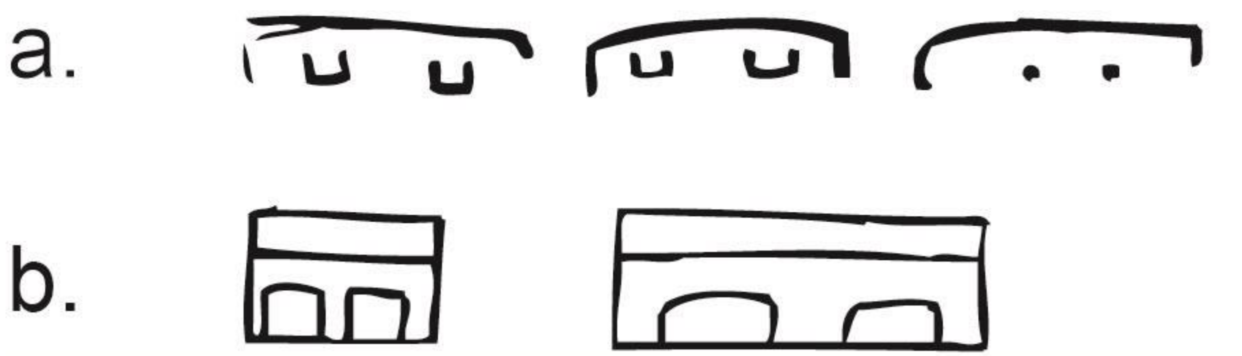


Figure 5.15 Comparative examples of related graphemes. (a) – Isthmian *wʉ* sign examples (J. Dobereiner, after Kaufman and Justeson 2001) (b) – Signs 19 and 35 from Cascajal block (J. Dobereiner, after del Carmen et. al 2006)

If these graphemes are a glyphic inscription, the use of ceramic media for this text would be an additional line of evidence to suggest an Isthmian connection; inscribed pottery does not appear in the Maya area until Early Classic Tzakol, but the Chiapa de Corzo sherd has been dated to the Late Preclassic Chiapa IV ceramic phase, Francesa (450-300 BCE) (Houston 2004; Lowe 1977; Méluzin 1995Houston, 2004 #1523:296). As the nearest site to Rancho Búfalo with confirmed early writing, the use of similar media is significant – especially given John Clark’s note that the sherd was of a ware local to Chiapa de Corzo (as quoted in Houston 2004:296).

The form of the Rancho Búfalo sherd also differs from other ceramics at the site, with a simple internal thickening of the rim that contrasts with more common wide, everted rims (Figure 13b). Further, while the paste and limestone temper are within the range of other Middle Preclassic ceramics at Rancho Búfalo, the surface finish is unique. In contrast to thick and waxy slips with, often with uneven coloring, mottling and surface crazing and orange coloring, the Rancho Búfalo sherd has a matte slip of a deep red or even brown color. This is largely uniform across the surface, but the slip is flakey and thin, and did not preserve as well as the waxy-wares found with it. This finish is more similar to matte red slips found in pre-Mamom ceramic complexes from the Maya area, Preclassic materials from the periphery of Palenque, and Western wares from Chiapa de Corzo and the Chiapas Highlands that persist through the introduction of waxy-wares in those area (Andrews 1990:9; Estrada-Belli 2011; Rands 1969).

Collectively, the non-Maya or Pre-Mamom attributes of the ceramic vessel, the use of incisions on portable media, and the resemblance of the central grapheme to the Isthmian script tradition reflect a stronger influence from the west than from the Maya heartland to the east. An Isthmian attribution would make it the easternmost example of non-Maya script, an especially important find given its association with a largely Maya ceramic assemblage.

<u>5.4.3.2</u> *Interpretations of Form and Design*

As a foreign ware with non-local symbols, the most likely explanation for the Rancho Búfalo sherd is that it was imported. While the incisions may have been locally made, no other similar ceramics or designs have yet been found at the site. The presence of an imported sherd with graphemes at Rancho Búfalo suggests that objects with writing or proto-writing were circulating across Southern Mesoamerica during the Preclassic. Physical movement of such goods between regions with Maya and Isthmian scripts may have facilitated the mutual awareness and sharing that occurred between these writing traditions (Lacadena 2010).

Whether imported or locally manufactured, the Rancho Búfalo sherd demonstrates a role for geographic peripheries in the emergence of Mesoamerican scribal traditions, improving our ability to compare the region with other, global cases of early writing (Li, et al. 2003; Postgate, et al. 1995). The presence of Middle Preclassic graphemes at a small and geographically separated site such as Rancho Búfalo reveals a previously unattested space for negotiation and innovation beyond the direct influence of emergent regional powers. Local people were able to utilize scribal traditions outside of the control of centralized Preclassic centers in the Maya Lowlands and Gulf Coast, and in the process may have facilitated their development.

Within local context, imported artifacts with writing would have been socially significant prestige goods at a small, frontier site such as Rancho Búfalo (Kipp and Schortman 1989). Those controlling these symbols would have been positioned to mediate their interpretation, even if the graphemes were not formal writing, as in Classic period examples of pseudo-glyphs (Calvin 2006:188; LeCount, et al. 2002:50). Elites would have been able to use the written form to connect themselves with the extra-local ceremonialism associated with texts, irrespective of their own level of literacy (Houston 1994).

Claude Lévi-Strauss (1961) documented this type of appropriation of the written form among the indigenous Nambikwara in the Brazilian Amazon. The local chief, recognizing the power represented in Lévi-Strauss' use of writing, was inspired to emulate the anthropologist: "And now, no sooner was everyone assembled than he drew forth from a basket a piece of paper covered with scribbled lines and pretended to read from it" (1961:289). In interpreting this use of writing-as-performance, Lévi-Strauss noted that "the symbol had been borrowed, but the reality remained quite foreign…it was not a question of knowing specific things, or understanding them…but merely of enhancing the prestige and authority of one individual or one function at the expense of the rest of the party" (1961:290). In keeping with the Nambikwara, Rancho Búfalo's comparatively small population and distance from major centers may have enabled similar elite use of writing-as-performance instead of writing-as-visual-speech. More examples will be needed to fully understand the precise narrative surrounding the presence of these glyphic forms in Eastern Chiapas.

5.5 Conclusion

Throughout the history of Mesoamerica, geographically disparate cultures often interacted. In studying Preclassic script traditions, Oaxacan, Maya, Isthmian, and various Olmec inscriptions reflect this interregional influence and innovation (Houston 2004; Lacadena 2010; Urcid 2001). This continued into the Classic and Postclassic periods, when Aztec, Zapotec, Teotihuacano and Maya scripts inspired one another, co-existed, and were even borrowed across regions (Taube 2011; Urcid 2001, 2011; Zender 2008). The same can be said for ceramic traditions of Mesoamerica. The current understanding of Preclassic interaction has so far derived primarily from research at major centers in the Maya, Olmec and Oaxacan cultural heartlands. Work at sites like Rancho Búfalo offers an opportunity to see what traditions were being employed at "spaces between" and assess the impact they had on ceramic production, and iconographic choices. This can help reconstruct how centers like Rancho Búfalo acted as conduits for the spread of cultural traditions.

The modal analysis applied to the Rancho Búfalo ceramic assemblage, and its emphasis on surface finish, has demonstrated the non-uniform connectivity between regions in Southern

Mesoamerica. Their intensity of contact does not follow a simple gravity model (Renfrew 1969). The site's ceramics, in large measure, matched with well-established typologies from Petén. Yet, Rancho Búfalo's slips are more evocative of Komchen, Yucatán than neighboring centers like Ceibal or Altar de Sacrificios, Guatemala.

The Rancho Búfalo glyphic sherd, along with the double line breaks and skyband sherd, stand in contrast to this Lowland Maya connectivity. They instead suggest contact with Western cultural traditions. While they are few in number, they cannot be discounted in import, given that there few iconographic examples at the site overall. The likely non-local origin of the Rancho Búfalo writing sherd suggests that script-sharing may have been facilitated by the physical exchange of written materials along routes used more broadly for trade and communication – the likes of which may have also been the source for the movement of ceramic traditions, and a wider range of ritual knowledge.

For Formative Mesoamerica, this analysis offers something in the way of an answer to "an interesting paradox in terms of social identity. It would seem that there were two competing (perhaps unwittingly) social identities at play during this era: a newly developing corpus of objects made to be seen and used in the public sphere and domestic objects used in the private sphere" (Cheetham 2007:25). The contrast between general similarities to Petén in ceramic forms and Gulf Coast selections of iconography, speaks to this incorporative tension. Rancho Búfalo ceramics, which originate in space between the well-documented Maya and Olmec cultural cores, demonstrate how there can be a dynamic incorporation of non-local materials. At the same time, the fact that they coexist, highlights the weakness in efforts to regionally circumscribe various traditions, instead of assessing them as a part of a heterogeneous, but unified, emergent Mesoamerican World Civilization.

CHAPTER 6 - OBJECTS ALIVE, OBJECTS IN MOTION: SPECIAL DEPOSITS AND EXCHANGE AT RANCHO BÚFALO

In early complex societies, emergent elites often used restricted knowledge surrounding ritual practices as a source of authority (Flad 2008:403; Rick 2004:77). The ceramics and architecture explored in the preceding two chapters can certainly be interpreted through this lens; Rancho Búfalo's carefully designed built environment, and the vessels used in feasts, reflect elite efforts to manifest awe in subjects and visitors by manipulating their bodily comportment (Bell 1992:98; Smith 2015a). This chapter focuses on a broader range of ritual deposits and actions at Rancho Búfalo that may also have served as elite signals that they possessed special access to materials and knowledge (Fogelin 2007:65; Renfrew 1994:50). While anthropologists have traditionally considered these religious practices a domain of relative conservatism, they are increasingly understood to function like other manifestations of identity that can be transmitted or hybridized across social boundaries (Carlsen 2001; Carrasco 1990:169; Jaffe 2015:9). By understanding Rancho Búfalo's ritual traditions, it is possible to explore how the social identity and belief at the site related to Mesoamerica more broadly.

Ritual practices have often been categorized as something apart from quotidian practices based on the involvement of individuals or objects that enter a liminal state as part of a given behavior (Turner 1967:7; van Gennep 1960). For example, in acts of sacrifice, there is a cross-cultural shared root in "the forceful setting apart of a valued object" (Carrasco 2013:211). The Mesoamerican cosmovision, however, supported an animistic and embodied view of objects, ancestors, and the sacred realm that complicates the simple separation of ritual and quotidian.[2] As Stephen Houston notes, “past and present, Maya communities do participate in a shared form of reference about living things. They endorse the claim that things might talk, entreat, assail, dissent, hunger, thirst and assist" (Houston 2014b:75). For Mesoamerican peoples who were surrounded by “things” with lives of their own, at what point could they be understood as "set aside" and engaged in ritual?

In this chapter, I use this perspective to approach material acquisition and distribution as something that was equally sacralized as the depositional events that garner most archaeological focus. I suggest a ruler’s ability to accomplish goals of long-distance exchange or production may have been valued in the same manner as his or her ability to perform autosacrifice, to manage time, and to commune with supernatural forces through ritual deposits (Freidel, et al. 1993; Rice 2008; Stuart 1984). While the acquisition and control of luxury goods was central for nascent elites of the Mesoamerican "world civilization," these objects were animated witnesses and participants in these actions (Rathje 1971).

The way these ritual practices were executed can be explored as one of several aspects of identity that impacts studies of culture contact (Jaffe 2015:9). At Rancho Búfalo, obsidian and

[2] Zapotec cosmology (Oaxaca) may contain a contrasting view through the concept of *pé*, "the vital force that made all living things move, thereby distinguishing them from nonliving matter" (Flannery and Marcus 1976:374-383) Inanimate objects were understood to be capable of manipulation much more easily than those things with *pé.*

greenstone provide archaeological accessible lines of evidence to study the possible ties between sacred acts and cross-regional connectivity. The site's four known burial features, and its unusual lack of Preclassic figurines, suggest beliefs surrounding bodily comportment at the site were shared with the Northern Maya Lowlands. The practices surrounding the use of greenstone and obsidian, in contrast, suggest connections with more proximate centers in the Southern Maya Lowlands and the Gulf Coast region.

6.1 Objects, Belief and Power in Mesoamerica

Ritual constructions, objects and acts across Mesoamerica invoked actions by the gods in a divine age (Carrasco 1990:123). While these took place in a realm apart from the present world, their reenactment by humans in the corporeal realm could connect people to sacred time, and perpetuate the world system (Eliade 1985). These ritual cosmograms extend beyond human actions to be reflected in the design of Mesoamerican sites, structures, and ritual deposits. From massive cities like Teotihuacan to compact site cores like Xunatunich, Belize, sites were planned with a consciousness of ideological elements, directionality, and numeration that referred to this godly realm (Ashmore and Sabloff 2002:211; Aveni 1980; Carrasco 1999:31; Moctezuma 1999; S. Sugiyama 1993:108; Wheatley 1969). Classic Maya pyramids stood as personified “flower-mountains,” and Tenochtitlán’s Postclassic Templo Mayor was an earthly manifestation of *Coatepec* (Boone 1989; Carrasco 1982:169; Fash and Fash 1996:133; Taube 2004a). Ritual deposits could similarly reflect the cosmological realm, through the careful placement of objects to evoke the cardinal directions, the watery underworld, the terrestrial world, and the sky (Carrasco 1999:70; López Luján 2005:207).

For individuals within communities, their quadripartite bodies, and the actions taken with them while alive or dead could similarly serve as a metaphor for the cosmos (Carrasco 1991). Classic Maya kings, in a cycle of death and rebirth known from the Popol Vuh, became like maize and continued moving through the underworld in a cycle of rebirth (Carrasco 1995; Christenson 2007; Fitzsimmons 2009). The same ritual connotations that were made in mortuary treatment surrounding these events could also be made with offerings in place of actual human remains. At Preclassic Ceibal, greenstone caches, ceramic offering vessels, and burials all occur variably along the E-Group centerline, but seem to have been deposited at similar public events (Inomata 2014:27). A more direct conflation between people and objects in an underworld setting is known from the tunnel under the Temple of the Feathered Serpent at Classic period Teotihuacan, where a male-female pair of greenstone figurines served in place of a human burial (Figure 6.1). While the use of effigies in place of people may be perceived as symbolic by a western audience, given notions of embodied objects in Mesoamerica, it may have been understood by their peoples as equivalent to the deposition of actual human remains (Gómez Chávez 2015).

Figure 6.1 Male-female greenstone offering pair from Temple of the Feathered Serpent Offering (Instituto Nacional de Antropología e Historia/ S. Gómez Chávez)

This inter-changeability was possible because material that is treated as inanimate within a western worldview could be imbued with literal life in Mesoamerica (Houston 2014b). In the case of Classic Period Maya monuments, an *ajaw* shown on a plaza stela was actively projecting their sight on the surrounding community; he or she was present and able to observe (Houston, et al. 2006:167). Political upheaval was accompanied by literal de-facing, or removal of eyes of these depicted personages. Globally, monumental personages and texts are typically destroyed simultaneously as a tool to delegitimize historical narratives; in the Maya case, texts were left intact (Houston and Stuart 1998:95). The choice to deface them was a literal effort to kill a monument ensouled with the individual it depicted (Golden and Davenport 2013:149). The willful destruction of Olmec monuments with portraiture or individualized thrones may similarly have accompanied a change of rulership at a site, perhaps to neutralize supernatural powers that were suddenly sufficient lacking mediation (Grove 1981:67).

This perception of life among monuments extends to portable material culture as well. In the Florentine Codex, compiled by Bernardino de Sahagún from native Aztec informants in the 16th century, mineral prospectors explained how they used the moist breath volutes released by precious stones to locate them (Figure 6.2) (Sahagún, et al. 1950:Book 11:221). Among the Maya, this same connection with breath is made with stones such as jade, manufactured objects like earspools, and other materials (Taube 2005:32). This extended to "non-exotic" materials as well; kernels of maize were part of a narrative of gods travelling through the underworld; a literal skull of the maize god waiting to be reborn (Taube 1985).

Figure 6.2 Image from Florentine Codex; seeking precious stones by their vapor

For Mesoamericans, this animism led to an intimate tie between the acquisition and use of exotics. The inalienability of gifted objects, like name-tagged Ik' pots which were traded across Classic Maya royal courts, was heightened by the life contained within the material (Mauss 1954; Tokovinine 2016). The use, movement and deposition of ensouled objects may have had similar resonance with ritual practices involving the live sacrifice of animals (N. Sugiyama, et al. 2013). Working of these materials was an "encounter between flesh-and-blood craftsman and the immanent spirits of stone" (Houston 2014b:25). Extended to exchange, elite efforts to use foreign goods to integrate local community members should be understood to have taken place in a realm of religious and spiritual behavior (Anderson 2006). These agentive objects may have offered resistance to behaviors, or the introduction of new world views, creating a possibility for conservatism *outside* the human realm (Hodder 2012; Jaffe 2015; Latour 2005).

While exchange may be a "causative factor in cultural change within a given region," an import's impact varied based on how materials were perceived overall, and how they were used (Renfrew 1969:151). During periods of emergent social complexity, the symbolic value of controlling the flow of luxury goods was likely more important than the formalist "economic value" of possessing them (Kipp and Schortman 1989; Lamberg-Karlovsky and Sabloff 1995; Renfrew 1969). In Mesoamerica, this was amplified by the animated nature of the objects being acquired and distributed. Elites with access to restricted trade networks who redistributed luxury goods in an effort to gain power over individuals, or to bolster the relative power of their community were mediating with agentive objects on behalf of their subjects.

Scholars traditionally dichotomize Pre-Columbian Maya exchange into ritual and utilitarian spheres. Bulk utilitarian goods like food and salt are presumed to have been distributed through heterarchical systems like marketing (Andrews 1983; Dahlin, et al. 2010; Yaegar 2010). Elites are presumed to have retained redistributive control over difficult to acquire exotics like obsidian, feathers, jade and shell (Freidel and Schele 1988; Kipp and Schortman 1989; Saturno 2009; Webb 1974). This dual model is "a *caricature* rather than an accurate *characterization* of evolving Maya economic systems" (emphasis original) (Demarest 2004:162). It suggests that different goods could be treated and perceived as operating in separate spheres of exchange (Kopytoff 1986). Yet, given how Mesoamerican peoples explicitly tied quotidian maize to their most treasured materials, jade and human blood, this division may be a misrepresentation of on the ground realities (Joyce, et al. 1991; Sandstrom 1991; Taube 1985).

Ethnohistoric data supports a model where elites controlled systems of exotic resource acquisition and deposition, but also had an interest in bulk good redistribution and the strategic placement of markets (Andrews 1983:130; Chase and Chase 2014; Polanyi 2001; Shaw 2012; Wells 2006). During the Classic Period, the movement of exotic objects may have been in the hands of *ebeet* specialists who acted as attached royal emissaries between royal courts (Tokovinine and Beliaev 2013:178). During the Preclassic, evidence for the presence of exchange comes instead from finds of non-local objects like obsidian that were sourced hundreds, or thousands, of kilometers from their find locations (Chase and Chase 2014:246; Masson and Freidel 2012; Ploeg 1991:224; Potter and King 1995:19; Tourtellot and Sabloff 1972:133).

6.2 Obsidian at Rancho Búfalo

Obsidian is a volcanic glass that, when properly worked, can produce a molecular edge that is sharper than steel (Buck 1982; Clark 1987; Crabtree 1968; Sheets and Muto 1972). Alongside this pragmatic utility, compared to chert, obsidian was above all a material for special acts and sacrifice; its sharp edge optimal for cutting flesh, or for producing fast-healing cuts for autosacrifice (Houston 2014b:25). Indeed, the Classic Maya god of rulership, (*K'awiil*) is depicted with an obsidian knife in his forehead (Stuart 2010:292). Among the Aztec, the name of the powerful god *Tezcatlipoca* translates as smoking obsidian mirror (Saunders 2001:222). For elites, obsidian's spiritual importance and the challenges in ensuring a reliable supply of this material from hundreds of kilometers away, would have made controlling its exchange and distribution an important aspect of rulership (Orellana 1977; Saunders 2001).

A total of 1012 artifacts of obsidian were recovered from excavations at Rancho Búfalo. These were subjected to two separate analysis: chemical analysis by pXRF to determine the source of the material, and typological analysis to reveal how it was being worked and distributed. The results of the provenance analysis were then periodized and compared to previous obsidian sourcing data from the Maya area, Chiapas, and Gulf Coast. Overall, this obsidian sourcing data suggests that Preclassic Rancho Búfalo was connected with exchange routes utilized in the Maya Lowlands during this period, and not Gulf Coast routes of exchange.

These obsidian artifacts were also subjected to a typological analysis to determine material abundance and whether they were manufactured on site. During the Preclassic period elites began to transform obsidian into prismatic blades and coordinate the trade routes along which it was distributed. While obsidian blades were not a necessity for the development of agricultural societies in the sub-tropical forest environment of the Maya Lowlands, it was a preferred and powerful material (Rathje 1971; Sidrys 1976:459). The typological analysis, in particular the presence of abundant expended cores, suggests that obsidian arrived at Rancho Búfalo in the form of prepared cores. These may have been knapped into blades and redistributed by elites, perhaps in elaborate social contexts.

6.2.1 Provenance Analysis

Obsidian is common at Lowland Maya sites, despite the region's distance from quarries located hundreds of kilometers away in the highlands of Guatemala, or in some cases, 1000 kilometers away in Central Mexico (Figure 6.3) (Stross, et al. 1983). For archaeologists, the ubiquity of obsidian, alongside advantages of its preservation and the ease of chemical sourcing, allow this material to offer insights into the networks elites may have employed to acquire exotic goods (Braswell 2010; De León, et al. 2009; Golitko and Feinman 2015; Golitko, et al. 2012). Each quarry has a unique chemical signature (Jack and Heizer 1968; Nelson, et al. 1978; Stross, et al. 1983). Archaeological examples can be assigned to them reliably and non-destructively through chemical analytical methods such as X-ray fluorescence spectrometry (XRF) (Asaro, et al. 1978; Shackley 2005; Tykot 2002; Tykot, et al. 2008).

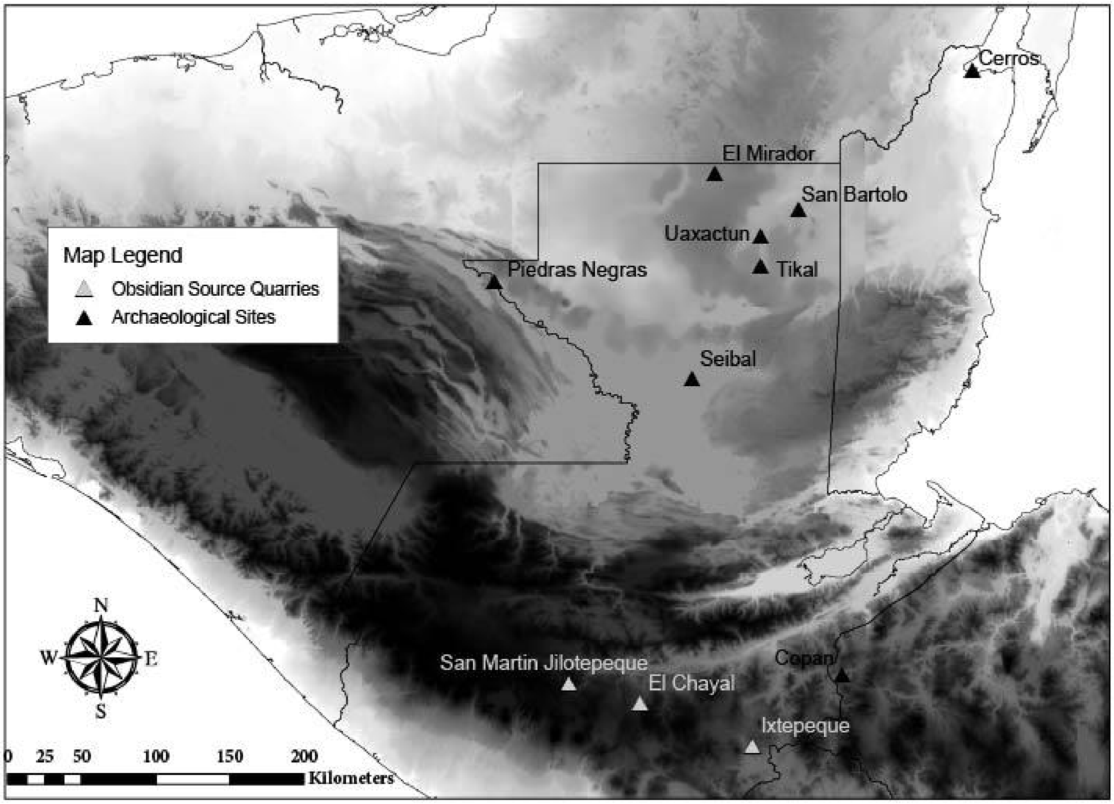


Figure 6.3 Map of Southern Maya Area, showing location of selected Preclassic sites, and Guatemalan obsidian source quarries (J. Dobereiner)

6.2.1.1 Methods and Results

1007 of the 1012 obsidian fragments recovered from Rancho Búfalo were successfully chemically sourced with portable X-ray fluorescence (pXRF). Spectral data were collected with a Bruker Tracer III - V pXRF spectrometer, serial number Kθ738+, owned by the Department of Anthropology at Harvard University. A green "obsidian" filter (12 mil Al + 1 mil Ti + 6 mil Cu) was used to enhance results for certain elements known to be useful for sourcing obsidian, while the analysis settings chosen were 40 kV, 28 υA, and 90 second run times for archaeological samples.

A lack of consistency in obsidian reporting methods has led to issues in comparing and repeating trace element analyses (Asaro, et al. 1978). Following trends in studies of archaeological obsidian and conventions in reporting, part per million (PPM) was selected as the most repeatable and cross-comparable means of data collection and analysis (Nazaroff, et al. 2010). The conversions were made in conjunction with S1CalProcess and calibrations established by Bruker, in collaboration with Dr. Bruce Kaiser.

Archaeological samples were plotted in simple statistical graphs and graphically attributed to individual sources (Figure 6.4). Graphing the ratio of rubidium to zirconium against the ratio of strontium to zirconium was sufficient to assign all of the material tested into one of four source quarries. Multivariate graphs on the full range of ten trace elements that were detected (magnesium, iron, zinc, gallium, tungsten, rubidium, strontium, yttrium, zirconium and niobium) tightened these clusters, but did not lead to different findings than those derived from the three most variable elements (Figure 6.5). Full trace element compositions for all tested samples were recorded, to allow future analysis (Table C.1).

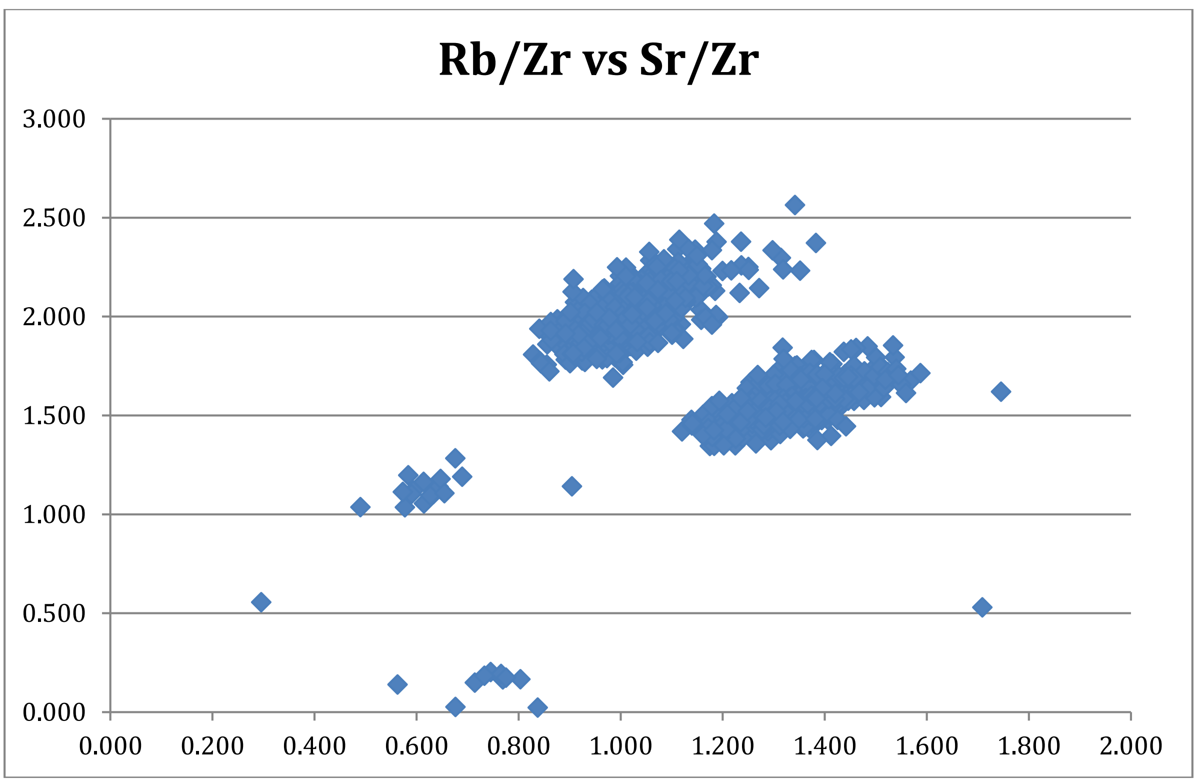


Figure 6.4 Trivariate Graphs of RB obsidian (J. Dobereiner)

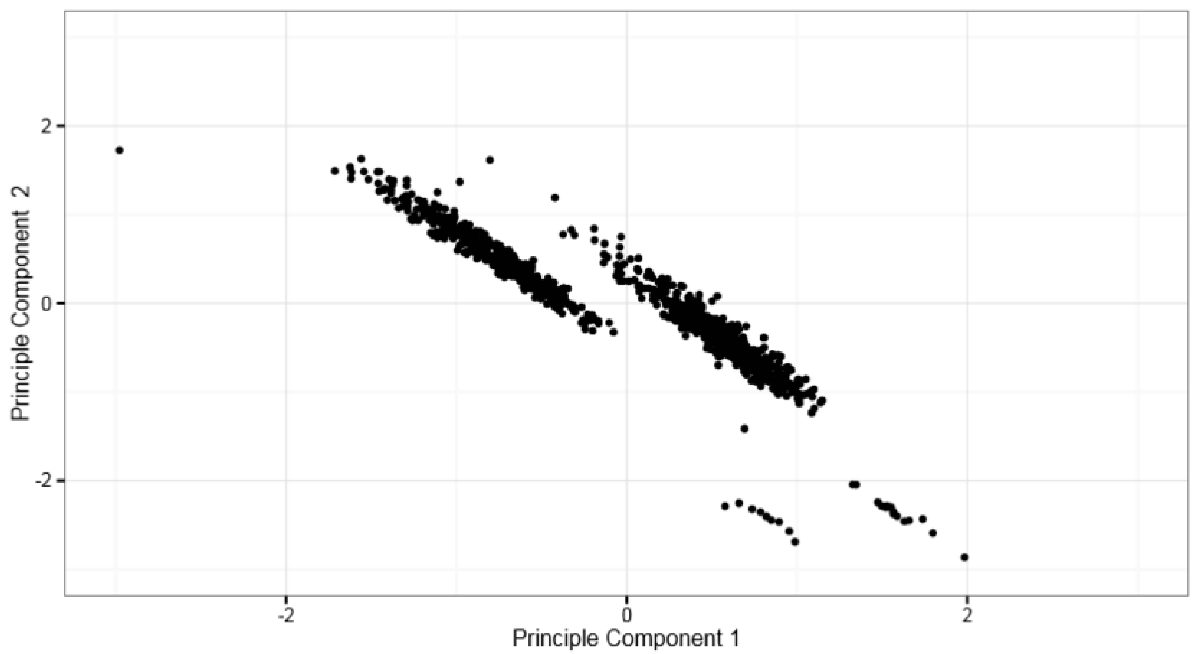


Figure 6.5 Principle components analysis of Rancho Búfalo obsidian provenance data; (D. Lee, Bruker Incorporated)

Baseline trace element composition of Maya obsidian sources have already been established by Adam Nazaroff and colleagues (2010), but a complementary set of comparative PPM data were generated from geological samples that were spectrally characterized with a Bruker Trace III-V pXRF at the University of South Florida from the following sources: Cruz de Milagro, El Chayal, Guadalupe Victoria, Ixtepeque, Otumba, Paredon, San Martin Jilotepeque, Ucareo, and Zaragoza. An "obsidian" filter (12 mil Al + 1 mil Ti + 6 mil Cu) was also used. The chosen analysis settings were 40 kV, 10 υA, and 360 seconds. This information made it possible to assign the four “clusters” of Rancho Búfalo material to three highland Guatemala sources of Ixtepeque (IX), San Martin Jilotepeque (SMJ), El Chayal (EC) and the Central Mexican source of Zaragoza, Hidalgo (ZA) (Table 6.1).

Table 6.1 Rancho Búfalo Obsidian Provenance Data by Period, n = 1007

	EC	SMJ	IX	ZA	Unknown
Total (n=1007)					
Number of Pieces	389	595	15	8	5
Percentage of Total	38.4%	58.8%	1.5%	0.8%	0.5%
Preclassic (n=739)					
Number of Pieces	233	485	11	8	2
Percentage of Total	31.5%	65.6%	1.5%	1.2%	0.3%
Classic (n=119)					
Number of Pieces	74	40	2	0	3
Percentage of Total	62.2%	33.6%	1.7%	0%	2.5%

The sub meter stratigraphy at Rancho Búfalo, as well as a millennium of active bioturbation from roots and gophers, makes it difficult to separate these materials by chronological phase. However, in an effort to organize the results by period, a likely-Preclassic sub-sample (n=744) was generated by zeroing lots that were generated from surface collections, the cleaning of looting damage (11A-2, 11A-3) and sub-operations that were designed to study Classic-period reoccupations (1H, 1F and 6F). Similarly, residential surfaces from later period reoccupations in operations 1H and 6F (n = 119) were separated as a likely Classic period sample. There was no straightforward way to separate the Middle and Late Preclassic. However, three units from within architectural fill of the destroyed portions of the earthen platform E6-4 (11A-4, 11A-5) and the destroyed ballcourt D6-8 (6A-6) are believed to represent sealed Middle Preclassic contexts. All 46 obsidian fragments from within them were sourced to San Martin Jilotepeque, suggesting that Rancho Búfalo relied on this quarry intensively during the Middle Preclassic.

6.2.1.2 Provenance Discussion

The obsidian sources utilized at the site were compared with known source ratios from other regions (Nelson and Clark 1998). In this way, this study builds upon signal advances that have been made in the use of obsidian sourcing data at site, regional, and pan-Mesoamerican scales (Braswell 2003; Clark 1987; Golitko and Feinman 2015; Golitko, et al. 2012; Hirth 1998). If obsidian was received alongside exotic goods like fine cloth, feathers, jade and shell, then these networks of long distance goods acquisition may reflect differential connectivity between Preclassic centers (Polanyi 2001; Wells 2006). Even if these goods moved through means of tribute between centers in the elite sphere, as opposed to Classic period style decentralized exchange, the patterning provides a window into a heterogeneous landscape of variable contact between sites.

People in Preclassic Southern Mesoamerica largely relied on quarries in Guatemala, but there are regional differences in their source quarry preferences through time. During the Middle Preclassic, Maya peoples drew more heavily upon San Martin Jilotepeque, Guatemala whereas Mixe-Zoque peoples to the east utilized El Chayal, Guatemala (Aoyama 2008; Clark and Lee 1984; Nelson and Clark 1998). At La Venta itself, as well as San Lorenzo-Tenochititlán, El Chayal was also the primary source alongside several Central Mexican quarries (Coe and Diehl 1980:391; Jack and Heizer 1968). Entering the Late Preclassic period, most Maya sites drew upon both El Chayal and San Martin Jilotepeque material, though there is variation in the use ratio between centers (Figure 6.6) (Brown, et al. 2004; Fowler, et al. 1989; Nelson 1985; P. M. Rice, et al. 1985).

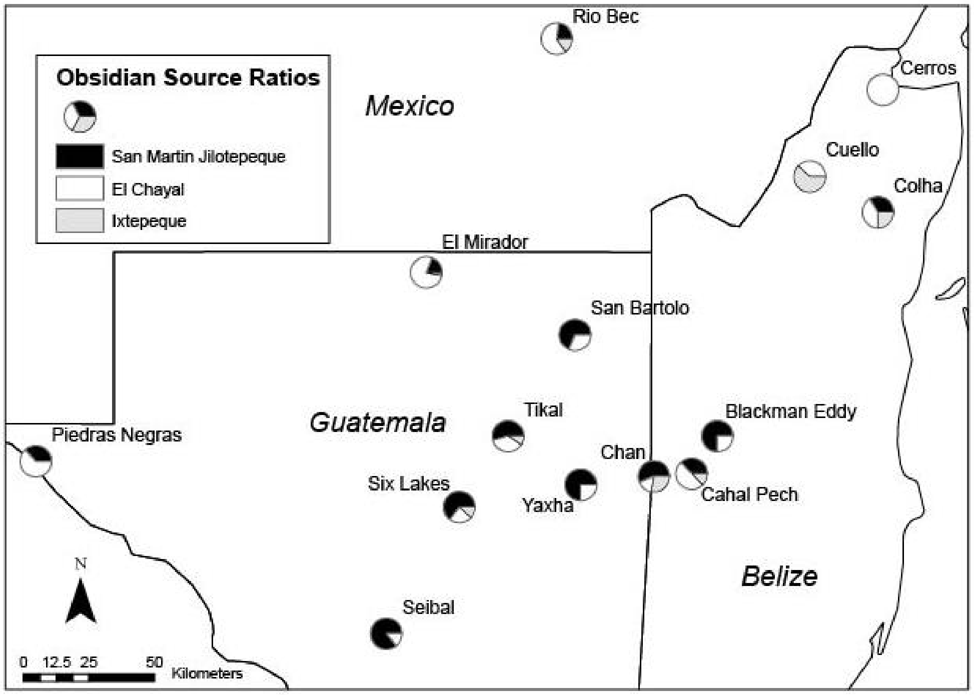


Figure 6.6 Map of Late Preclassic obsidian quarry use ratios, where n > 5 (J. Dobereiner)

The Rancho Búfalo results indicate its residents primarily, though not exclusively, utilized material from San Martin Jilotepeque during the Preclassic period. This fits with a model where obsidian was travelling from east to west to enter the site, and conforms to other Lowland and Pacific Coastal Maya sites, suggesting that networks through the Maya Lowlands were being utilized most actively by the region's residents. While the presence of El Chayal and Central Mexican material at Rancho Búfalo may suggest a western connection as well, it is impossible to definitively date this material to the Middle Preclassic, when it would indicate connectivity with the Mixe Zoquean area. By the Late Preclassic and into the Classic period, El Chayal was used throughout the Maya Lowlands (Dreiss and Brown 1989). This source quarry also became dominant at Rancho Búfalo by the Classic period, rendering its presence in earlier mixed lots non-diagnostic of Preclassic trade connections at the site.

6.2.2 Typological Analysis of Obsidian Fragments

Typological evidence from Middle Preclassic Soconusco, Chiapas has been used to argue for elite involvement in obsidian acquisition and prismatic blade production (Figure 6.7) (Clark 1986, 1987). These blades may have been distributed ritually during meaningful social events, and the technological knowledge behind them protected, as a mode of fortifying elite power (Clark 1987; Drennan 1984; LaBiana and Scham 2006). Further, since prismatic blade production technology allows a small of amount of obsidian to produce a substantial amount of cutting edge per unit mass, production efficiency benefits from converting cores into prismatic blades could be experienced most at the community level (Buck 1982; Clark 1987; Crabtree 1968; Sheets and Muto 1972). This means elites who were attempting to supply a range of community members would have benefitted most from this technology, implying either their involvement, or the involvement of itinerant craftspeople for whom producing blades by the hundreds would also have had utility (Hendon 1996). However, obsidian tool types in the Copán Valley, a region very close to the obsidian quarry of Ixtepeque, also transitioned from flakes to blades upon the introduction of Maya rule during the Early Classic (Aoyama 2001). This suggests an association between this tool type and rulership (but for a contrasting view see Hirth, et al. 2013a).

Figure 6.7 Obsidian core and blades, Palenque Site Museum (J. Dobereiner)

The system used to collect dimensions from the Rancho Búfalo obsidian assemblage was adapted from standard lithic measuring methodologies, using a digital caliper and analytical balance (Sutton and Arkush 2001:52). Type of stone tool or production debris has also been determined; over half of the obsidian artifacts are fragments of, or reworked, obsidian blades. Others pieces have been characterized as production debris, including macroblades, preparation flakes, depleted cores, and debitage that may occupy different parts of the operational sequence (Bar-Yosef and Peer 2009; Grace 1997). Alongside chemical data, these typological data are in Table C.2. A summary of counts is below (Table 6.2).

Table 6.2 Quantitative and typological analysis of Rancho Búfalo obsidian.

	Tools				Production Debris			
	Blade	Reworked Blade	Flake	Other Tool	Core	Macroblade	Preparation Flake	Debitage
Total (n=1007)								
N =	459	109	103	18	35	58	126	100
% of Total	45.4%	10.8%	10.2%	1.8%	3.5%	5.7%	12.5%	9.9%
Preclassic (n=739)								
N =	323	60	81	12	30	44	102	84
% of Total	43.7%	8.1%	11.0%	2.4%	4.1%	6.0%	13.8%	11.4%
Classic (n=119)								
N =	59	24	6	3	2	4	11	12
% of Total	49.6%	20.2%	5.0%	2.5%	1.7%	3.4%	9.2%	10.1%

6.2.2.1 *Typology Discussion*

Recent work by Jason De Leon and colleagues has demonstrated the system of core-based exchange in Mesoamerica developed alongside increasing political centralization (2009). In periods before blade-technology became widespread in Mesoamerica, flakes and expedient tools were spread through down-the-line exchange. Once blade technology was developed, they were still primarily manufactured in proximity to quarries, and travelled as finished products to their destinations. Finally, once a broader system of rulership emerged, prepared cores travelled to destinations and were accompanied by local blade production (De León, et al. 2009:113). These changes are frequently accompanied by a reduction in blade width, as the networks of exchange become increasingly elite managed and circumscribed (Nance and de Leeuw 2005).

Rancho Búfalo does not possess Early Formative depositional contexts that predate the production of blades, and the sealed Middle Preclassic contexts from 6A and 11A contain both blades and production debitage. Among the site's Preclassic deposits, however, there is a ratio of less than 11 blades per core. Given that hundreds of blades could be produced from a given core, this suggests that the site may have acted as an import hub or re-distribution node. The overall numbers of obsidian artifacts, over 1000 pieces collected across three field seasons, dwarf the overall count from the first three seasons at much larger Preclassic projects like that at San Bartolo, Guatemala. This suggest that, especially for the size of the ceremonial core, the elites at Rancho Búfalo were relatively successful at acquiring and redistributing long distance exotic trade goods. This may have contributed to the site's prominent position as one of few Preclassic centers in the Middle Usumacinta region.

6.3 Greenstone Deposits

Jade was one of the most valuable materials in Pre-Columbian Mesoamerica; it represented water, fertility, and the breath of life (Taube 2005; Taube and Ishihara-Brito 2012). The only source used in Pre-Columbian times is along the Motagua River valley of western Guatemala, hundreds of kilometers distant from the Maya Lowlands, and even more so from Gulf Coast (Brown 1984; Drennan 1984). It was a rare trade good that could only be accessed through long distance exchange. Further, as the hardest material available in Mesoamerica, the transformation of raw jade into refined and polished items took a substantial amount of effort, primarily through heat cracking, sanding, and the use of abrasives and string. In this way, along with its religious meaning, it was loaded with both exotic and labor-intensive connotations. These attributes made jade a potent symbol of power for elites throughout Mesoamerican history (Kovacevich 2013; Trigger 1990). Visually analogous materials, in particular serpentine or dark green quartzite, could be perceived "social jade" - imbued with similar meanings, but available from closer sources and easier to work (Clark and Colman 2013:19; Taube 2004b:179).

6.3.1 Western Traditions in Greenstone

Olmec jade carvers made anthropomorphic masks and figurines, but among the most symbolically loaded items they made of this substance were greenstone celts and axes. Axes could be used to represent the transition to sedentary life; they were crucial items for the clearing of trees and brush to form the common spaces used for settled life and community (Taube 2004b:18). While chert axes may have been more abundant and practical, symbolic greenstone and serpentine axes were a regular ritual deposition in the Olmec area at La Venta and Cerro de las Mesas, Veracruz (Drucker 1955, 1959; Stirling 1957).

In addition to architectural traditions, the caches and use of jade and greenstone at La Venta are crucial to understanding the site's importance in the emergence of Mesoamerican complex society. The site is known for its abundant centerline jade caches in the northern ceremonial precinct, bounded to the south by the C-1 pyramid, and to north by various monuments and low structures (Drucker 1959; Stirling 1957). This has been called the central offering axis within the MFC model (Clark and Hansen 2001). At La Venta, finds on this axis included moderately sized axe caches and symbolic deposits, as well as "massive deposits," with hundreds of greenstone bricks spread over tens of square meters, and ensouled by representing the faces of gods (Figure 6.8) (Drucker 1959:128). Locally, they are believed to have marked the initiation of construction phases II - IV at La Venta (Gillespie and Volk 2014:3). These were understood to have been put in place and immediately covered, as a ritual act of sacrifice and foundation that would symbolically center the community (Gillespie 2008). The substantial nature of these caches, as well as their distinct physical usage of greenstone, has made them a marker for Olmec influence in other parts of Mesoamerica.

Figure 6.8 La Venta Massive Offering of Serpentine Bricks (J. Dobereiner)

Another series of centerline caches were found at San Isidro, Chiapas, a site approximately 120 kilometers southeast of La Venta that was destroyed by the opening of the Malpaso Dam in 1966 (Lee 1974; Lowe 1981:122). They were deposited near Mound 20, a major earthen platform in the northern portion of the site (Lee 1974:8). The deposits are associated with the Equipac and Felisa ceramic phases that are considered contemporaneous to the Olmec (Lowe 1981:242). Several offerings of jade celts were found along the primary east-west ritual axis. Cache 11 was the deepest and earliest deposition, and consisted of 11 greenstone celts with collimated orientations deposited alongside a series of jade ear spools and varied pottery (Lowe 1981:243). These depositional events included 11 celt caches and 4 burials with associated celt offerings. The largest was Cache 65, which consisted of 45 crude tuff celts. There was extensive evidence of disturbance and damage to the deposit, suggesting associated greenstone and jade offerings may be missing due to looting in antiquity (Lowe 1981:248).

An analogous example was found in 2010 between Mounds 11 and 12 at Chiapa de Corzo, Chiapas. Chiapa de Corzo is on the western edge of the Preclassic Olmec area, and on the threshold of influence from the Lowland Maya of Guatemalan Petén and the Highland Maya of the Pacific Coast. This is the westernmost example of a Grijalva River MFC pattern, 200 kilometers Southeast of La Venta, and only 150 kilometers west of Rancho Búfalo (Agrinier 1975; Clark and Hansen 2001; Lee, et al. 1969; Lowe 1962). Structures 11 and 12 are located to the far north of the site, on the central axis of a structure pair that also served as an E-group (Lowe and Agrinier 1960:7). Over 339 celts were discovered in association with burials and various other pieces in two deep pits along this central offering axis (Bachand 2013:33). These features, dubbed Massive Offering 1 and 2, are among the largest celt deposits known from Preclassic Mesoamerica outside of massive deposits within La Venta itself (Drucker 1959:128).

6.3.2 Greenstone in the Preclassic Maya Area

Within the traditionally defined Maya area, at both Ceibal and Cival, foundation caches have been found with jade and other depositions and burials (Clark and Colman 2013; Estrada-Belli 2006; Inomata 2014). A notable difference between the Olmec and Maya cases, however, can be seen in their relative position. In both Cival and Ceibal, they were found along the primary east-west axes to the south of the sites, associated with southern E-Group complexes. This contrasts with putatively Mixe-Zoquean examples from La Venta, Chiapa de Corzo and San Isidro where caches were placed in the north of the site, in articulation with either northern ceremonial precincts or E-groups.

The first such caches found in the Maya area were discovered in 1975 at Ceibal during excavations by Gordon Willey's Harvard University project. Real-Xe Phase Cache 7 was a deposit with a 5 celts of materials including jade from the central plaza (Willey and Tourtellot 1978:89). These were arranged in a characteristic Maya cruciform pattern. At the time, it was suggested that this was evocative of Olmec influence, especially in light of questions involving the Xe ceramic assemblage at Ceibal, and its possible relationship with western traditions developed in Chiapas (Andrews 1990; Demarest 1976; Sabloff 1975). A similar jade cache was found at Cival along the site's E-group centerline (Estrada-Belli 2006:59; 2011). The celts were stood on-end in the form of a k'an cross, and deposited with a wide-array of ceramics and over 100 jade beads (Bauer 2005:29; Estrada-Belli 2006:62). Most recently, Inomata and colleagues, through their ongoing scholarship across the E-Group plaza, found several other E-Group caches, including a set of 12 axes in 2009 that complement the Willey find, and were sunk directly into the bedrock along the E-Group centerline (Figure 6.9) (Inomata 2014:29).

Figure 6.9 Ceibal Cache (T. Inomata)

6.3.3 The Rancho Búfalo Greenstone Deposit

The Maya-area E-group jade caches from Ceibal and Cival, and northern precinct caches at San Isidro and La Venta, demonstrate both of the unity of traditions across the emergent Mesoamerican "World Civilization", and the regional variation that accompany their execution. At Rancho Búfalo, a single cache of greenstone was found at the site (Figure 6.10). It is composed of a series of serpentine celts. Serpentine itself, while likely valued as social jade due to is green color, is too soft to be used practically as an adze or axe (Clark and Colman 2013:20). Given the use of this soft material, and their small size, it is unlikely that the Rancho Búfalo greenstones were produced for use as chopping tools. These were symbolic objects, and intentionally deposited in a group.

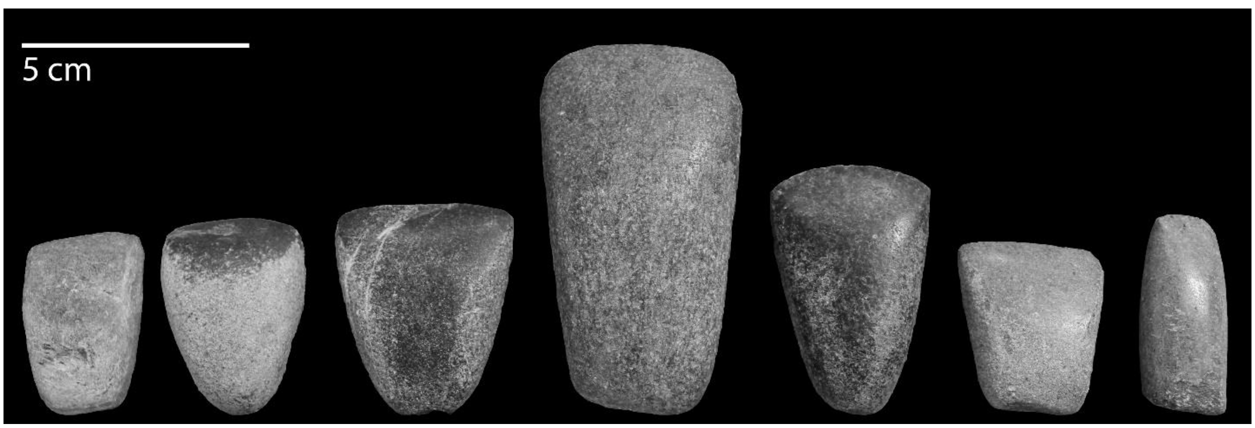


Figure 6.10 Rancho Búfalo Serpentine Celt Deposit (J. Dobereiner)

While they certainly represent an offering, these pieces were unfortunately not recovered archaeologically - Rancho Búfalo's modern landowners recovered them from the site while building their home in the late 1990's. This places them in the position of the northern ceremonial core This location is most commonly used in the Olmec Gulf Coast (Drucker 1959), whereas these caches are typically found on E-Group centerlines in Maya Lowland and Pacific

Coast contexts (Estrada-Belli 2011; Inomata, et al. 2013). In contrast to the apparent dependence of trade routes extending east into the Maya Lowlands based on obsidian acquisition data, this depositional location would tie Rancho Búfalo to western cultural currents from the Mixe-Zoquean region.

6.4 Embodied Presence: Burials and Figurines

Mortuary analysis offers a window into depositional and ritual behaviors that often correlate with social identity (Cerezo-Roman 2015; Jones 1997). Examining bodily treatments enables archaeologists to explore worldviews, and signaling through mortuary acts, that often crystalize across incorporative frontiers (Jaffe 2012; Smith 2003b). Accompanying burial furniture can be tied to ethnicity, or used to infer the rank of the deceased (Brown 1971). For the Maya, figurines and sculptures could also act as bodies that, through their treatment, became "invested with a sense of ritual" (Bachand, et al. 2003; Bell 1992:98). Human representations, then, serve alongside corporeal remains as archaeological indicators of how different Mesoamerican peoples tied religious belief to bodily action (Gillespie 2001; Halperin 2010).

During the Classic period, the curation and veneration of ancestral remains had deep resonance among the Maya (McAnany 1995). Elaborate funerary contexts for ruling *ajaws* were placed in major temples within site cores, reaching their maximum elaboration with examples like the tombs of Pakal at Palenque and Chan Imix K'awiil at Copán (Carrasco 1995:436; Fash 2001; Stuart and Stuart 2008). The tomb of Copán's founder, Yax K'uk Mo', designed a burial monument where his remains and burial furniture remained accessible as a community shrine (Agurcia Fasquelle and Fash 2005; Ashmore 2015:220). Even when not built for reentry, monuments like Tikal Altar 5 demonstrate how burials were at times exhumed to acquire ritually charged human remains (Figure 6.11). Beyond monumental tombs, elites and commoners alike placed burials under house floors as a form of local placemaking (McAnany 1995). Entering the Postclassic, the decoration of ancestral bones among the 16th century Maya of Yucatán, and complex skulls covered with turquoise mosaics by the Aztec, may represent related beliefs (Klein 1986:139; Landa, et al. 1941:131).

Figure 6.11 Tikal Altar 5 (L. Schele)

Ancestral veneration permeates social practices and bodily treatments of emergent complex societies in many world regions. In ancestor cults of the Pre-Pottery Neolithic, veneration of deceased progenitors was marked by an emergent tradition of plastered skulls

(Beinert 1991; Goring-Morris 2000; Kenyon 1957; Kuijt 2001). Similarly early Andean ancestral veneration is attested from the 9000 BC Chinchorro mummies of Chile's Pacific Coast (Urton 2014). A model of ancestor worship through deposition of remains may have stretched deep into Mesoamerican antiquity as well, as represented by a partial skull mask from 600 BC that was found at the Maya site of Cuello, Belize (Hammond, et al. 2002:952). By 300 BC, the placement of burials under floors in residential groups at Ceibal, Guatemala was commonplace (Inomata, et al. 2015). Preclassic ancestor cults could have helped early centers to maintain cohesion, serving as a religious glue that held communities together in the face of rapidly changing technologies and practices that accompanied the emergent Mesoamerican world civilization (Watkins 2006:19).

6.4.1 Contextualizing Burials at Rancho Búfalo

Rancho Búfalo's mortuary sample thus far consists of only four burials, yet their heterogeneity can be interpreted as a sign of social dynamism at the site (Figure 6.12). All four differ substantially from one another; they were placed in diverse orientations, body positions, and furnished with a range of offerings. Yet, despite the variations, there are also similarities. The body's alignments differ axially along 90° steps from the 30° east-of-north orientation which was central to the site's architecture. Over nearly a millennium, the importance of this directionality was maintained in both habitations and ritual deposits. At the same time, the burials' heterogeneity indicates a diversity of practice that may suggest rapid changes. There is something both local, and global, in the social identities presented by these interred remains.

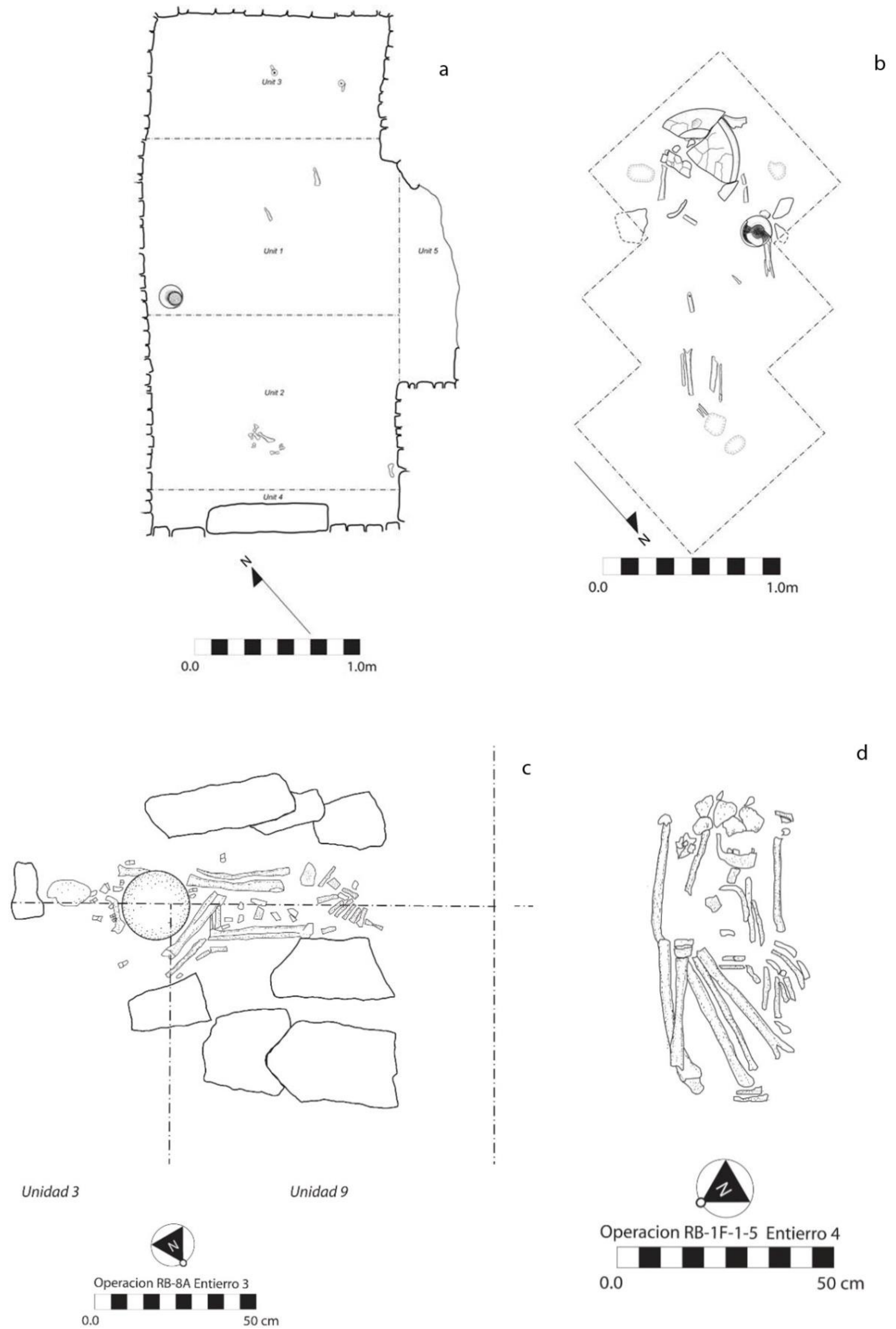


Figure 6.12 Burials at Rancho Búfalo - a) Burial 1, extended on back at 30°, tomb (A.K. Scherer) b) Burial 2, extended on back at 210°, no enclosure (A.K. Scherer) c) Burial 3, flexed on back at 120°, crypt (J. Dobereiner) d) Burial 4, flexed on back at 120°, no enclosure (Y. Cabrera and J. Dobereiner)

Burial 1 (Figure 6.12a) was found in a masonry tomb within structure D5-3 in the style of examples from Protoclassic Tikal, a topic discussed at length in Chapter 4. While looted in antiquity, vestiges of the rich burial furniture that were left behind included a ceramic vessel, shell earrings and a bone needle that may have accompanied a burial shroud. Enough human bones were present in the D5-3 tomb excavation to determine the orientation of the body (30° east-of-north) and that it was extended on its back. Burial 2 (Figure 6.12b) was an extended burial on its back at 210°, found in the base of a possible low house platform. While the burial had no enclosing structure, its accompanying artifacts included two high slipped ceramic vessels and a large obsidian flake.

These can be compared with Preclassic Mesoamerica more broadly, including an extensive record of Preclassic burials from the Maya area, the Pacific Coast, and the cemetery at Chiapa de Corzo (Pincemin 1991; Robin 1989). The Olmec themselves, due to issues of decomposition in the acidic soils of the Gulf Coast region, do not have preserved remains (Clark and Colman 2013; Tiesler 2010). The oldest burial at Rancho Búfalo, Burial 2, is similar to broader Late Preclassic traditions from the Southern Maya Lowlands, including instances of extended burials with vessels placed close by, or directly above, their heads from nearby Piedras Negras and El Lacandon (Bravo 2013:61). Burial 1, primarily based on the accompanying tomb structure, can be compared with a later Maya context; Tikal Burial 167 from the Protoclassic.

Burial 3 (Figure 6.12c) was a flexed burial on its back at 120° east-of-north in a crypt north of structure D6-3 in a style noted in Yucatán and Belize. It possessed a single ceramic vessel. Burial 4 (Figure 6.12d) was also flexed burial on its back at 120° east-of-north found directly north of D5-4. It possessed no enclosing structure, nor burial furniture, though two small, flat, unworked stones appear to have been intentionally placed directly on top of it. These flexed forms at Rancho Búfalo date to the Classic Period. These forms occur in several contexts in the Maya Lowlands, ranging from the flexed sacrificial victims in Piedras Negras Burial 110, to the supine flexed burial in a tomb context at Tikal Burial 85 (Scherer 2015:84-86). The majority of burials at Classic Period El Lacandon are flexed as well (Bravo 2013:111). These two sites share an Usumacinta regional resonance in bodily comportment.

6.4.2 Preclassic Figurine Traditions

Beyond physical burials, bodily practices were also supported and enacted through the use of ceramic and jade figurines. The analysis of Early Formative ceramic figurines from Taltilco, Mexico and the Soconusco basin has extended beyond uncritical attribution to fertility rituals, to a broader, contextual analysis (Lesure 2002:601). Figurines at times represented generalized members of society and their production was an individual act that reified the producer's surrounding culture and beliefs (Joyce 2008:126). In this type of manufacture, their production in ceramic "restructured knowledgeable persons with particular dispositions towards action" (Joyce and Lopiparo 2005:370).

A role beyond household embodiment is definitively present by the Middle Formative, where it has been documented in the Central Mexican site of Chalcatzingo, Morelos (Grove and Gillespie 1984). These arguments have been extended to the Middle Preclassic Maya centers of Cuello, Belize, and the Six Lakes Region, Petén, where ceremonial decapitation of figurines is believed to have accompanied the death of rulers (Hammond 1989:112; Rice 2015:7). This class of object was commonplace in centers across Petén, Chiapas, and Pacific and Gulf Coast centers. During the Preclassic Period, the study of figurines can serve alongside burials to offer a window into local traditions of embodied objects and people, and how they changed under the influence of the emergent Mesoamerican world civilization.

However, unlike most Preclassic sites, no terracotta figurines have been found at Rancho Búfalo. While absence of evidence is not evidence of absence, the lack of a single figurine among tens of thousands of ceramic fragments from diverse contexts is likely significant. Quantitative data on find frequencies is rare, but a pair of Middle Preclassic mixed *chultun* contexts in Tikal's Mundo Perdido group contained approximately 20,000 sherds, alongside at least 39 figurines - a find rate of approximately 1 in 500 (Laporte 1995:45). At El Lacandon, only 50 km distant, dozens of figurines evocative of Olmec and Belizean traditions were recovered (Figure 6.13) (Bravo 2013:59). It appears that Rancho Búfalo was distinct for the region in never developing a regime of Preclassic figurine use and deposition. The only other part of the Preclassic Maya world where they have not been found are Northern Lowland centers including Komchen (Rice 2015:8)

Figure 6.13 Figurines from El Lacandon, Chiapas (J. Dobereiner)

6.5 Ritual and Exchange at Rancho Búfalo

At Rancho Búfalo, the acquisition, distribution, and deposition of portable objects and personages were all imbued with sacred significance due to the Maya understanding of animism within raw materials like stone, and human embodiment within figurines and sculpture (Houston 2014b). The sacred steps in these object's *chaîne opératoire* can be compared with other regions of Formative Mesoamerica as a means of studying interregional interaction. As with Rancho Búfalo's architecture and ceramics, these data demonstrate that the site's residents had diverse affinities. In some ways, Rancho Búfalo's residents resembled neighboring communities of the Southern Maya Lowlands, Pacific Coast, and Grijalva River region. In others, they differed dramatically, even from nearby centers of the Usumacinta Region. Overall, the site's incorporation into the Mesoamerican "world civilization" led its residents to employ a diverse series of local and global practices and use them simultaneously in a manner that demonstrates both flexibility and continuity.

Rancho Búfalo’s inhabitants drew upon the same obsidian quarries as the Southern Lowlands, which suggests that they were accessing the same exchange networks. Through time, the shifts in ratios of use between San Martin Jilotepeque and El Chayal, Guatemala mirrored Southern Lowland centers including Tikal and El Mirador. Gulf Coast and Grijalva River centers relied on El Chayal and Central Mexican sources much earlier, but these did not appear at Rancho Búfalo until the Classic Period. Burials 1 and 2 at the site also conformed with broader Southern Lowland and Belizean traditions of the Preclassic Mortuary tradition, further suggesting the site's strongest ritual affinities were with the area traditionally defined as Maya.

In other behaviors, the site traditions deviated strongly from the Southern Lowlands. The residents of Rancho Búfalo used the deposition of greenstone axes as a form of place making that marked a symbolic break with nomadic life. They deposited ceremonial greenstone lithics that resembled celts recovered from Ceibal and Cival in Guatemala. However, due to differences in site architecture, they could not directly replicate actions at these eastern centers – there was no E-Group centerline at Rancho Búfalo along which to place them. Instead, they placed this ritual deposit to the north of the site; mirroring a use of northern ceremonial precincts that is attested at Gulf Coast sites like La Venta, Tabasco.

The site differs from nearly all parts of Mesoamerica in the conspicuous absence of terracotta figurines. Preclassic figurines have been found in high frequencies across Petén within the traditionally defined Mixe-Zoque and Olmec areas, and even within the Usumacinta Region at the nearby center of El Lacandon, Chiapas. The only other region of Preclassic Southern Mesoamerica where figurines are absent is the Northern Lowlands. Similarities between the Northern Lowlands and Rancho Búfalo include analogous platform designs, a lack of E-Groups, and mottled ceramic surface finishes that have been explored in previous chapters. If the mortuary treatments and figurines were indeed part of a broader ancestor cult in most of Southern Mesoamerica, it appears that the people of the Northern Lowlands and Rancho Búfalo innovated different ways of communing with the ancestors.

Overall, the integration of ritual practices from other regions, alongside those considered "local," could be categorized in a general sense as foreign influence, but the people of Rancho Búfalo *chose* to execute disparate practices simultaneously. They defied local conventions in figurine usage while embracing it in mortuary treatments, and this choice did not inhibit their linkages to obsidian acquisition networks. Indeed, the nature and quantity of obsidian at the site suggests they had better access than many larger Petén centers. While figurine traditions and mortuary practices are often considered signals within a community, it is apparent that both those from within and without Rancho Búfalo would have understood the signals encoded in this unique combination of social practices. This heterogeneity at a single site weakens the supposed regional boundaries that are expected to circumscribe the regions with which they are most associated. At the same time, they demonstrate local resilience on the incorporative frontier of the Mesoamerican World Civilization.

CHAPTER 7 - CONCLUSION

This dissertation focused on diversity within the material culture that accompanied the emergence of Mesoamerican social complexity. Fundamentally, it was an exploration of whether the spread of a given "world civilization" can be understood as a *scalar* difference within a broader hierarchy of nested identities, instead of a typological difference where local responses were fundamentally different than in preceding incorporative events. While the geographic focus was Mesoamerica, in particular the site of Rancho Búfalo, Chiapas, Mexico, the theoretical underpinnings come from a wide range of regions and times, and have cross-applicability in other contexts. By interpreting the relationship between material traditions at Rancho Búfalo and the Mesoamerican world through this theoretical lens, I illustrated shortcomings in past approaches to the region's Formative period, and the possibilities in investigating it through an identity-driven perspective.

7.1 Rancho Búfalo: A Site Apart

Mapping, excavations, and laboratory analyses of ceramics and obsidian at Rancho Búfalo have revealed that the site had diverse influences which cross-cut the traditional archaeological cultures used to classify Formative Mesoamerican centers. As explored in the preceding chapters, even within single material categories, the site drew upon multiple regions. For example, Rancho Búfalo's ceramic forms most resembled its eastern neighbors in the Southern Lowlands, the iconography placed upon its ceramics invoked either the Southern Lowlands to the east or the Gulf Coast Region to the west, and its ceramic slips most resembled sites in the non-adjoining Northern Lowlands. Rancho Búfalo's site plan evoked generalized traditions of Southern Mesoamerica, but its orientation and lack of an E-Group make it in some ways unique unto itself. Across its material traditions, Rancho Búfalo cannot be fit neatly into traditionally defined Formative Mesoamerican groups such as Maya, Olmec, Zapotec or Pacific Coastal. What could explain its material heterogeneity?

In part, the diversity of traditions at Rancho Búfalo, Chiapas, Mexico was prompted by its role as a community in the sparsely populated Preclassic (1000 BC - 250 AD) Usumacinta River corridor. It straddled a major north-west river valley and east-west mountain passes, putting it in a position to mediate exchange and movement across the region. Scholars have previously suggested that the greater Usumacinta served as a Middle Preclassic borderland between the Gulf Coast Olmec and the Lowland Maya cultures (Andrews 1990; Bravo 2013:14-16; Ekholm-Miller 1973; Lowe 1991; Rands 2007) Further, the Middle Usumacinta has a Postclassic history of active exchange with Yucatán (Andrews, et al. 1984; Bishop, et al. 2012; Jeménez Álvarez 2012; Kepecs 1998; Kowalski 1989). The site was uniquely positioned to exploit these networks during the Preclassic. However, the extra local contacts that led to such diverse architecture, ceramics, obsidian, and ritual deposits suggest a community of residents with a core social identity that does not fit neatly within the scholarly typology of Formative archaeological cultures.

One possibility is that Rancho Búfalo functioned as a "borderland" site. The theoretical corpus linking identity with territory, borders, and frontiers is so large that it can make the field seem like a discipline in and of itself (Meskell 2002; Zendeño 2008). Intermediately positioned hinterland sites like Rancho Búfalo can represent borderland communities where people forged a negotiated identity between multiple groups (Parker 2006). Frontier peoples can be conduits of exchange and interaction, and within these culturally peripheral third spaces can develop new traditions unconstrained by the "cores" of more centralized communities (Bhabha 1994:55;

Lightfoot 1995:476; Ur and Hammer 2009). However, most models for frontiers as foci of cultural change have been developed with the expectation of reified cultural groups as participants, and an exploitive power differential between them (Liebmann 2013:31; Lightfoot and Martinez 1995).

In times of nascent social complexity, was there sufficient development of core groups to generate a meaningful frontier along which a place like Rancho Búfalo could have been a borderland site? Certainly the Maya and Olmec are *described* as essentialized entities that exerted frontier pressure during the Middle Preclassic (Guernsey 2006; Navarrete 1978; Rosenswig 2010). However, this nomenclature emerged in the mid-20th century, with little consideration of ethnogenesis, or at what point in history the Olmec and Maya became defined social categories (Grove 1989; Sociedad mexicana de antropología 1942). A borderland approach can only serve as an effective interpretive lens for Rancho Búfalo's social identity if categories of "Maya" and "Olmec" are effective analytical units with which the site's material culture can be compared.

7.2 Beyond the Mother Sister Cultural Debate: Olmec and Maya as Non-Essentialized Groups

Much research on the emergence of Mesoamerican civilization has been designed to assess possible Olmec primacy in this process (Backes Jr., et al. 2012; Blomster, et al. 2005; Coe and Diehl 1980; Demarest 1976; Flannery, et al. 2005; Neff et al. 2006a; Sharer, et al. 2006; Stoltman, et al. 2005). This culture-historical perspective treats early Mesoamerican regions as representative of reified cultural entities: the Gulf Coast Olmec, the Basin of Mexico, Valley of Morelos, Coastal Chiapas, the Zapotec of Oaxaca, and the Lowland and Highland Maya

(Flannery and Marcus 2000:7). The Olmec are often presumed to have primacy in the development of political and material systems of Mesoamerica due to their remarkable stone sculpture and relatively large and densely populated settlements (the "mother-culture" perspective) (Brown 1984; Diehl and Coe 1996:11; Hirth, et al. 2013b; Pires-Ferreira and Evans 1978). Others have argued that they existed alongside their neighbors as one of many interacting and competing cultures, the model of peer polities (the "sister-culture" perspective) (Renfrew 1996; Rosenswig 2010:77).

Distinguishing these cultures in antiquity has largely been based on projecting ethnolinguistic groups like "Mayan" and "Mixe-Zoquean" back in time as "Olmec" and "Maya" archaeological cultures (Grove 1989). The assumption this is built on, that language, culture, and people exist as well-partitioned entities over thousands of years, has been thoroughly rewritten since these categories were first developed (Barth 1969; Fabian 1983). By designing my research to focus on material diversity instead of focusing on fitting this site within these cultural categories, I moved beyond the "mother culture-sister culture debate," and built upon discussions of Mesoamerican social complexity that model on-the-ground social processes (e.g. Blanton, et al. 1996; Clark and Blake 1994; Lesure 2004).

Part of the weakness in putting too much emphasis on cultures with well-defined boundaries during the Formative is that mobile groups and sedentary groups coexisted during this period (Inomata, et al. 2015). The composition of a given community would be altered regularly by the movements of these nomadic and semi-nomadic people (Arnold 1999:158.; Hayden 1996:50). They had a likely role in the interchange and collaboration that has been detected with increasingly frequency as impacting emergent Mesoamerican social complexity

(Coe and Diehl 1980; Dahlin, et al. 1987:371; Inomata, et al. 2013; Kaufman 1976; Lacadena 2010; Quirarte 1977).

For example: both Mayan and Mixe-Zoque language speakers are now thought to have been fundamental participants in the development of the Classic Maya writing system, a finding that should prompt discussions on the role of multi-regionalism in the emergence of Mesoamerican civilization more broadly (Lacadena 2010). The Neolithic traditions developed around 2000 BC by cultures like Ocos and Soconusco, including maize cultivation and ballcourts, quickly spread to a broad range of regions with diverse languages, well beyond their Pacific Coastal origins (Hill, et al. 1998; Rosenswig 2010). Mesoamerica's earliest E-groups have been found in Ceibal, Guatemala, suggesting that the Middle Formative Chiapas plan long associated with the Olmec may have been developed through a process of cross-regional interaction (Inomata, et al. 2013). Lime plaster had some of its earliest uses west in the Valley of Oaxaca (ca. 1350 BC), and to the east in Cuello, Belize, seemingly skipping the Gulf Coast entirely (Flannery and Marcus 2000:8; Hammond 1991:13).

These discoveries blur lines between cultures by showing that architecture, ritual practices, and other material practices actively crossed these boundaries. I further broke down the boundaries between the traditionally defined Maya and Olmec heartlands through my reassessment of architectural and iconography at centers from throughout Southern Mesoamerica. While these are typologized as two culture area, the diversity within and similarities across them make clear the serious challenge to straightforward classification of Formative Mesoamerican center. As laid out in Chapter 3, the architectural and iconographic similarities that have been used to distinguish Maya and Olmec as cultural entities do not hold up to intensive scrutiny. While Rancho Búfalo itself had unprecedented variability, the diversity across all of these Formative centers makes clear that *Rancho Búfalo was not unique in being unique.* The heterogeneity at Rancho Búfalo and these other Formative sites set up the basis of my dissertation's primary culture historical argument: **while the archaeological cultures of "Olmec" and "Maya" are frequently presented as implicitly essentialized entities, the sites within them are too diverse to be easily grouped during the Preclassic period.**

7.3 The Emergence of the Mesoamerican World Civilization at Rancho Búfalo

The diversity between these centers can be understood most readily through an alternative model where communities were able to respond in a localized manner to a broader culture current. If emergent complex society in Mesoamerica was accompanied by a new "world civilization," the movement of this superordinate identity category across the landscape would be based on its local integration into a given community. People signaled these identities through the agentive, poetic use of material culture. The interchange that led to its spreading may have been fueled by the mobile people who continued to move between centers through the Preclassic and into the Postclassic period (Berdan 2008:214). This bottom-up model contrasts with top-down approaches to early complexity that emphasize conflict, monopolization of resources, or elite exploitation. It places individual and group social identity as a central facet to the emergence of complex society, and brings questions of social integration to the foreground. How were heterogeneous groups brought together and integrated into a unified systems of ideology, inequality, and social hierarchy?

In contrast to later periods with formalized frontiers or borderlands, times of nascent social complexity were filled with "weakly" incorporative centers that would have been too small to generate a borderland population in the sociopolitical sense used above (Stein 2005:11).

As in outposts and diaspora colonies, the trappings of emergent complexity were absorbed variably by a given community, but did not supplant the local system (Dominguez 2002; Dommelen 2002:122; Spence 2005; Stein 1999). The primary tension in these "soft" incorporative frontiers were scalar differences between external trends and local traditions. Exploring material traditions within Formative Mesoamerica and at Rancho Búfalo through the lens of social poetics provided the data for my anthropological argument within this dissertation: **emergent complex societies, including in Mesoamerica, were predicated on the emergence of broader "world civilizations," that operated as superordinate identity categories in of themselves.** Attempting to classify Formative Mesoamerican sites as members of firmly defined cultural entities like Maya or Olmec is not an effective approach during the period of emergent social complexity. Most centers, including Rancho Búfalo, display a disregard for the supposed boundedness they are expected to be constrained by in this model of essentialized groups.

In the case of Rancho Búfalo, this tension between the local and the global played out in a variety of media. The site orientation offers a clear case. An inherently Usumacinta-region series of decisions are maintained at the site, even in the face of rapid sociopolitical shifts. Rancho Búfalo's residents were in contact with a range of extra-regional centers throughout the Preclassic, yet they maintained a 30 degree east-of-north orientation throughout their occupation history. From their earliest earthen platform wall in E6-4, through all later Preclassic construction, and even when the site was reoccupied, this orientation, and others that are 90 degrees perpendicular to it, dominated the architectural and depositional assemblages of the site, a poetic decision that would have sent an easily interpreted signal about local identity. The same orientations permeated other, later, Usumacinta centers like the Classic period Maya cities of

Yaxchilán and Piedras Negras (Scherer 2015:190-195; Tate 1992). There was an active interest in adopting extra-regional traits – but there is a limit to this flexibility as well.

In the above case, there was connectivity between Rancho Búfalo traditions and the surrounding the Usumacinta region. However, several material media at Rancho Búfalo display unexpected connectivity with the Northern Lowlands as well. The absence of an E-group at the site was unusual for the Southern Lowlands and Grijalva River Valley, but commonplace in the Northern Lowlands (May 2012). A similar pattern was reflected in the absence of ceramic figurines at Rancho Búfalo – again, an unusual finding for most of Mesoamerica, but one documented in Komchen, Yucatán (Rice 2015). The platform wall of Rancho Búfalo structure D6-4 also most resembled Preclassic masonry structures from Becán, Campeche and Komchen. Finally, the ceramic surface finishes at the site prominently resemble Komchen, in the presence of mottling and crazing in a large portion of the slips on waxy-ware ceramics (Andrews 1989).

Across other material categories, even more variability shines through at Rancho Búfalo. The site's tradition of greenstone deposits evoked La Venta, Tabasco, through its placement near Rancho Búfalo's northern ceremonial precinct. The site's mortuary tradition and burial furniture resembled Southern Lowland and Usumacinta sites more broadly. But the site's obsidian sources were a near perfect match for the Southern Lowlands, and do not appear to exploit any Central Mexican sources during the Preclassic.

Through a poetic lens, Rancho Búfalo's adoption of this variety of material traits from sites across many regions can be interpreted as strategic signaling to a range of audiences with whom they were trading, but also a core conservatism to maintain some lifeways as they had always been performed. In the context of the emergent Mesoamerican world civilization, its spread was based on its being accepted by a range of communities in a diachronic mode. The residents of Rancho Búfalo variably accepted, rejected, or modified customs that invoked this superordinate identity category, as well as various centers and regions with whom they were interacting. They instrumentally modified how they signaled their identity to improve access to long-distance networks of goods and knowledge. At the same time, the incorporation of non-local traditions did not inhibit their sense of local continuity (Silliman 2009).

Their decision making process was successful in helping the Rancho Búfalo community thrive over centuries. The center persists for an extended period in a region where few sites existed during the Preclassic. Further, the quality and quantity of obsidian at the site during the Preclassic period exceed that of many contemporaneous centers, even larger ones, suggesting that their access to trade routes was maintained over a substantial period. The site's Yucatecan connectivity may be indicative for the role of the Usumacinta region in regulating cultural and material exchange between the Gulf Coast and Northern Lowlands, a coastal route that may have allowed travel without passing through in the Southern Lowlands. It may offer a partial explanation for the early cross-regional interaction between these regions indicated by finds such as the Olmec jades at Chacsinkin, Yucatán (Andrews 1986).

The idea of flexible identities at sites like Rancho Búfalo is supported by ethnographic analogies, where identities are constantly emergent within a diachronic process, not reified and immutable. The limited time scale of ethnographies often implies a homogenous and stable entity in which political systems are better characterized as ongoing processes of instability, as noted by Edmund Leach in *Political Systems of Highland Burma* (1954). Archaeologists and historians are better poised to explore how these systems unfold because ethnographic perspectives provide limited synchronic snapshots. Leach, by exploring historical records, realized that the shift between egalitarian *gumlao* systems and the hierarchical *gumsa* systems was constantly in a cycle of becoming (Leach 1954:64). This fluidity is characteristic of identity groupings, especially in a fractured and emergent landscape like that in formative Mesoamerica.

The spread and acceptance of new styles, objects, and beliefs are driven by the articulation between the disparate social groups that already existed across the landscape, and the nature of the systems or "package" that is spreading – in this case, the emergent Mesoamerican "world civilization." In performing archaeology to study this period, it is possible to study the tension between these multiple scales of identity. Through this tension, there is an explanation for the spread of complex society, and also the lasting regional heterogeneity that emerges even as cultural categories like "Maya" begin to crystalize more firmly. It also, in part, explains the persistence of overarching cross-cultural narratives that link groups together over long distances. Traders, transhumant populations, and routes of interactions between regions led to the eventual emergence of ethnic-like boundaries over centuries and millennia. They also induced individuals and communities to transcend them. This multiscalar approach can be usefully applied to contexts well beyond Formative Mesoamerica, not just in loci of emergent social complexity, but as a type of non-coercive incorporative process that continues to occur in the modern world.

APPENDIX A - EXCAVATIONS AND MAPPING AT RANCHO BÚFALO

Figures in this appendix are denoted by the letter “A” preceding the Figure number.

Excavations

The Proyecto Arqueológico Busiljá- Chocoljá first visited Rancho Búfalo in 2010. In 2011, excavations were opened under the direction of Project Directors Charles Golden and Andrew Scherer, with Jeffrey Dobereiner and Alan Mendez Cab. In 2012 and 2013, Dobereiner directed excavations at the site with Mendez Cab, as well as a series of visiting students from UNICACH. Several looters trenches facilitated architectural investigations. Excavations took place in a total of 17 Operations between 2011-2013, as described below (Figure A.1 - A.3).

Operation 1 – Investigations Surrounding D5 Structure Plaza (Figures A.4 - A.16)

Sub-operation A – Investigations in and around D5-3 Tomb

Sub-operation A corresponds to a series of investigations of a single tomb in D5-3 which had been exposed by looting. Looters had stopped immediately above a series of cap-stones, and PABC archaeologists proceeded to open 5 units (1-5) in an effort to recovery any remains (Burial 1) or materials before they were fully exposed or destroyed by weather.

Burial 1 (RB-1A-1) The unit measures 1.3 x 1.0 meters.

Lot 1 terminated 95 cm below datum. It consisted of structural collapse (unworked stone) and dark brown soil (10 YR 3/3). Recovered materials included ceramics, chert flakes, obsidian fragments, animal bone, freshwater shell, and human bone.

Lot 2 consisted of soil and dirt directly above the tomb floor layer. Artifacts include shell earing, a bone needle and worked stucco. Burial 1 was partially contained in this layer.

Burial 1 (RB-1A-2) The unit measures 1.3 x 1.0 meters.

Lot 1 terminated 70 cm below datum. It consisted of structural collapse (unworked stone) and dark brown soil (10 YR 3/3). Recovered materials included ceramics, chert flakes, obsidian fragments, animal bone, freshwater shell, and human bone.

Lot 2 consisted of soil and dirt directly above the tomb floor layer. No artifacts were recovered, however, Burial 1 was partially contained in this layer.

Burial 1 (RB-1A-3) The unit measures 1.3 x .65 meters.

Lot 1 terminated 93 cm below datum. It consisted of structural collapse (unworked stone) and dark brown soil (10 YR 3/3). Recovered materials included ceramics, animal bone, freshwater shell, and human bone.

Lot 2 consisted of soil and dirt directly above the tomb floor layer. No artifacts were recovered, however, Burial 1 was partially contained in this layer.

Burial 1 (RB-1A-4) The unit measures 1.3 x .20 meters.

Lot 1 terminated 61 cm below datum. It consisted of structural collapse (unworked stone) and dark brown soil (10 YR 3/3). Recovered materials included ceramics, chert flakes, a stone ball, speleothems, obsidian fragments, animal bone, freshwater shell, and human bone.

Lot 2 consisted of soil and dirt directly above the tomb floor layer. No artifacts were recovered, however, Burial 1 was partially contained in this layer.

Burial 1 (RB-1A-5) The unit measures 1.2 x .3 meters.

Lot 1 terminated 91 cm below datum. It consisted of structural collapse (unworked stone) and dark brown soil (10 YR 3/3). Recovered materials included ceramics, a stone ball, animal bone, freshwater shell, and human bone.

Lot 2 consisted of soil and dirt directly above the tomb floor layer. No artifacts were recovered, however, Burial 1 was partially contained in this layer.

Sub-operation B – Surface collections around D5-2

(RB-1B-1) Surface collection yielding ceramics.

Sub-operation C – Investigations north of D5-6

(RB-1C-1) The unit measures 1.0 x 1.0 meters.

Lot 1 terminated 11 cm below datum. It consisted of a humus layer with very dark brown soil (10 YR 2/2). Recovered materials included ceramics, chert flakes, obsidian fragments, and shell.

Lot 2 terminated 35 cm below datum. It consisted of a fill layer with dark brown soil (7.5 YR 3/2). Recovered materials included ceramics, chert flakes, obsidian fragments, and shell.

Lot 3 terminated 57 cm below datum. It consisted of a fill layer with brown soil (10 YR 4/3). Recovered materials included ceramics, chert flakes, animal bone, and shell. Excavations did not reach bedrock.

Sub-operation D – Surface collections around D5-4

(RB-1D-1) Surface collection yielding ceramics.

Sub-operation E – Investigations north of D5-4

(RB-1E-1) The unit measures 1.0 x 1.0 meters.

Lot 1 terminated 16 cm below datum. It consisted of a humus layer with black soil (10 YR 2/1). Recovered materials included ceramics, chert flakes, obsidian fragments, a grinding stone, and shell.

Lot 2 terminated 36 cm below datum. It consisted of a fill layer with dark brown soil (7.5 YR 3/2) surrounded by small stones. Recovered materials included ceramics, chert flakes, obsidian fragments, animal bone, and shell. Excavations ended due to reaching bedrock.

Sub-operation F – Investigations northwest of D5-4

This sub-operation was located off the northwest corner of structure D5-4, in the ceremonial precinct in the north of the site. It consisted of a single unit.

(RB-1F-1) The unit measured 2 x 2 m and was oriented to match the site's structures, 30° east-of-north. It was designed to determine the occupation history of the structure and was positioned in hopes of finding either a corner or wall.

Lot 1 was a level of very dark brown humus (10 YR 2/2) which terminated 19 cm below the level of the datum (SE). Cultural material emerged, including ceramic, obsidian, chert, jute shell, animal bone, quartz and small stone balls, possible weights. This may have been primary context of an actively used occupation area.

Lot 2 consisted of a dark brown soil and small stone fill layer under the humus layer (10 YR 3/2) and terminated 50 cm below the level of the datum. Lot 2 contained very large quantities of ceramic, including a mamiform tetrapod protoclassic form. Other cultural materials, included obsidian, chert, and jute shell.

Lot 3 consisted of a brown soil matrix (10 YR 4/3). This level terminated 90 cm below the level of the datum. In contrast to the unit above, there was very little cultural material and ceramic. Besides ceramic, chert, jute shell, animal bone, and a worked bone were found.

Lot 4 was a level of brown (10 YR 4/4) soil. It terminated 96 cm below the level of the datum. There were few cultural materials, including ceramic and jute shell and the soil was powdery. It had the appearance of a natural layer of caliza. Two stones began to emerge from the center of the unit, where were determined at a later time to represent the capstone of a burial, Rancho Búfalo burial 4.

Lot 5 was dedicated to the excavation of burial 4. Its dimensions were 70 cm x 35 cm. It was surrounded by brown soil (10 YR 5/3) and terminated 104 cm below the level of the datum. It contained the intact human burial, and several unassociated pieces of ceramic.

Lot 6 was the final layer of the unit, also 2 x 2 meters, and consisted of material surrounding and underlying burial 4. It was surrounded by brown soil (10 YR 5/3) and terminated 124 cm below the level of the datum. It contained few artifacts, jute, ceramic, chert, and animal bone. RB-1F-1 provided abundant information about structure D5-4, revealing our first Protoclassic material from Rancho Búfalo, and an intact burial. Continuing excavations in the plaza will better determine demonstrate the structure's use.

Sub-operation H – Horizontal Excavations on Platform D5-8.

This sup-operation were horizontal excavations located on top of structure D5-6 believed to be a series of households. They were placed to associate with a series of surface-protruding stone walls and explore contexts inside and outside elite households. The excavation grid consisted of a series of twelve articulating 2 x 2 units, placed two across and six long. Of these, six were excavated in a checkerboard pattern of units, 1, 4, 5, 8, 9, 12.

(RB-1H-1) The unit was located in the northeast corner of the two by six grid. It was bounded on the west side by a low stone wall, thought to be of a house.

Lot 1 was a level of very dark brown humus (10 YR 2/2) which terminated 50 cm below the level of the datum (SW of unit 1H-4). The layer was shallow and filled with roots, and terminated over a layer of collapse stones. A plastic bag was found a few cm under surface level, so it was not believed to be an undisturbed context. The unit contained ceramic, chert, jute shell, obsidian, and bone.

Lot 2 was the layer of collapse stone. It was hoped the materials in and around this level would yield lived context materials, but the yield was limited. The next lot contained more materials. The lot was a layer of brown soil (10 YR 3/3) which terminated 56 cm below the level of the datum. It contained ceramics and some animal bone, a biface and an arrow point.

Lot 3 was the layer below that with and beyond that of the collapse stone, and consisted of layer of brown soil (10 YR 3/3) which terminated 73 cm below the level of the datum. It may represent lived context materials, including ceramic, shell, chert, obsidian, and an in-situ mano de metate and a biface, a bone needle, and a hematite stone.

Lot 4 was a cleanup excavation, that was terminated well before bedrock as it was beyond the level of possible in-situ household materials, and entering a fill layer. It was 10 cm below the level of lot 3 , and contained ceramic, obsidian, animal bone, and jute shell and red pigment, and stucco.

(RB-1H-4) The unit was located southwest from the corner of unit 1. It was on top of a likely house that was bordered on all side by stone.

Lot 1 was the only level that could be excavated above architectural material. It was a level of very dark brown humus (10 YR 2/2) which terminated 15 cm below the level of the datum (SW). The layer was shallow and filled with roots, and terminated over a possible stone floor, which we decided to leave intact. The unit contained ceramic, jute shell, animal bone, and obsidian.

(RB-1H-5) The unit was located northwest from the corner of unit 4. It was, like unit 1, believe to represent a living space external to the houses.

Lot 1 was a level of very dark brown humus (10 YR 2/2) which terminated 28 cm below the level of the datum (SE of unit 1H-8). The layer was shallow and filled with roots. The unit contained ceramic, chert, jute shell, obsidian, and animal bone.

Lot 2 was a layer of brown soil (10 YR 3/3) which terminated 31 cm below the level of the datum. It contained ceramics and some animal bone, a biface, chert, obsidian and a pyrite disk. This very much appeared to be a used surface with materials in situ.

(RB-1H-8) The unit was located southwest from the corner of unit 5. It was believed to represent a living space within a house, bounded by stone.

Lot 1 was a level of very dark brown humus in a matrix of small stones (10 YR 2/2) which terminated 18 cm below the level of the datum (SE). It contained ceramic, chert, bone needle, animal bone, chert and jute shell.

Lot 2 was a layer of brown soil (10 YR 3/3) that terminated 33 cm below the level of the datum (SE). It contained ceramic, jute shell, chert, animal bone, obsidian, quartz, and a perforated shell.

Lot 3 was a layer of brown soil (10 YR/3/4) that terminated 41 cm below the level of the datum (SE). This was reduced size (1 x 1) continuation below the lived surface and no longer a continuation of the actively used household area. It was designed to explore the chronology of the structure and reach bedrock. It contained ceramic, chert, jute shell, animal bone and obsidian. It was determined that

Lot 4 was a continuation of the 1 x 1 smaller unit. It was a layer of dark yellowish brown soil (10 YR 4/2) and a matrix of small fill stones that terminated 58 cm below the level of the datum. It contained ceramics, chert, obsidian, shell, and animal bone and a single figurine.

Lot 5 was a continuation of the 1 x 1 smaller unit. It was a wide fill layer of dark yellowish brown soil (10 YR 4/2) and a matrix of large fill stones that terminated 110 cm below the level of the datum. It contained ceramics, chert, obsidian, shell, and animal bone.

Lot 6 was a continuation of the 1 x 1 smaller unit. It was a fill layer of grayish brown soil (10 YR 5/2) and a matrix of large fill stones that terminated 154 cm below the level of the datum. Within it, appears to be a stone wall oriented 30 degrees east-of-north, perhaps the original household occupation. It contained ceramics, chert, obsidian, shell, and animal bone.

Lot 7 was a level below the level of the stone wall, into the bedrock surrounding it on both sides. It was caliza with nearly no artifacts, with powdery very pale orange 10 YR 8/2 soil. It only contained shell.

(RB-1H-9) The unit was located northwest from the corner of unit 8. It was believed to represent a living space outside of the house. The terrain layer itself had a few large stones, probably collapse from the household.

Lot 1 was a level of very dark brown humus (10 YR 2/2) which terminated 40 cm below the level of the datum (SE). It contained ceramic, chert, bone needle, animal bone, chert and jute shell as well as a small ball and the point of a lance or knife.

Lot 2 was a layer of brown soil (10 YR 3/3) that terminated 51 cm below the level of the datum at the level of many substantial stones. It may represent the floor of a working space, and we chose not to continue excavating (SE). It contained ceramic, jute shell, chert, animal bone, obsidian, a lance or knife point, and a mano de metate.

(RB-1H-12) The unit was located southwest from the corner of unit 8. It was believed to represent a living space outside of the house. The terrain layer had many large stones and was difficult to excavate.

Lot 1 was a level of very dark brown humus (10 YR 2/2) which terminated 28 cm below the level of the datum (SE). It contained ceramic, chert, bone needle, animal bone, chert and jute shell as well as burnt animal bone and a small ball.

Lot 2 was a layer of brown soil with many stones (10 YR 3/3) that terminated 42 cm below the level of the datum. The lot was extremely high yielding, and likely represent the floor of a working space. It contained ceramic, jute shell, chert, animal bone, obsidian, bajareque, and burnt bone.

Overall, the excavations in suboperation 1H yielded a large amount of primary contextual data. It appears that these were Preclassic households, and through careful horizontal excavations, materials were found in-situ including needles, food preparation tools, and ceramics. Laboratory analysis of these materials will offer a comparative sample of Preclassic living spaces from Rancho Búfalo.

Sub-operation J – Investigations Southeast of D5-3

(RB-1J-1)   This sup-operation was a single 2 x 2 excavations that was oriented to match the site's structures, 30° east-of-north. It was located west of structure D5-6, and south of the tomb structure from 2011, D5-3. It was excavated in hopes of finding a burial or cache, to understand Rancho Búfalo's Preclassic ceremonial contexts.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 11 cm below the level of the datum (SW). The layer was shallow and filled with roots, and terminated with a soil color change. The lot contained ceramic, chert, jute shell, obsidian, animal bone, as well as a crystal, hematite and a series of small balls. Several large in-situ fineware sherds were found in the Northwest and Southwest corners, and were left in situ to help find more in context.

Lot 2 was a layer of dark brown soil (10 YR 3/3) which terminated 22 cm below the level of the datum. It contained ceramics, chert, obsidian, shell, animal bone, a biface and more balls. More giant sherds were found in situ, especially in the Southwest corner. At every level, throughout the excavation, more pieces of this fineware red were found. It appears that it may have been a disturbed cache.

Lot 3 was a layer of very dark yellowish brown soil (10 YR 3/2) which terminated 29 cm below the level of the datum. It contained ceramics, chert, obsidian, shell, animal bone. Also, pieces of this fineware red were found. A mano in the north balk could not be extracted, and prompted the excavation of a .20 by .40 meter unit for the purpose of its removal.

Lot 4 was a layer of very dark brown soil (10 YR 3/3) which terminated 56 cm below the level of the datum. It terminated at the level of a soft bedrock. It contained ceramics, chert, obsidian, shell, animal bone. Also, pieces of this fineware red were found in association with several human skull fragments and teeth from the head of what is likely a disturbed burial. It seems that the reason that the ceramic fineware from the southwest corner of the unit was found at so many levels is that a gopher, or the production of the fence nearby, had seriously disturbed the materials within, and destroyed both the offering vessel and the interred individual.

Lot 5 was the caliza directly overlying the bedrock that terminated 67 cm below the level of the datum. It was a layer of 10 YR 6/1 gray soil, with few artifacts. It contained ceramics, jute shell, and a metate. The ceramics do continue in the white cal right up to the level of the bedrock, so there is evidence of occupation.

(RB-1J-2) Unit 2 was a 20 x 40 cm unit excavated specifically to retrieve the unusual mano discovered within RB-1J-1 lot 4.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 9 cm below the level of the datum (SW of Unit 1). The lot contained ceramic and jute shell.

Lot 2 a layer of dark brown soil (10 YR 3/3) which terminated 18 cm below the level of the datum. The lot contained ceramic and jute shell, and allowed access to the worked piece of limestone mano that had been seen in unit 1.

This pair of units demonstrated the quantity of ceremonial deposits in the northern ceremonial precinct in the site. While no intact burials or caches were found, this area seems to have many. This data will guide future excavations of the area.

Operation 2 – Surface Collections Surrounding D5 Structure Plaza

(RB-2A-1) Surface collection yielding ceramics.

Operation 3 – Investigations Surrounding E5 Structure Plaza (Figures A.17 - A.19)

Sub-operation A – Investigations near platform E5-3

While excavating a single unit to establish site chronology (1) a burial was discovered. This led to opening several more units (2, 3, 4) to fully expose and recover the burial.

Burial 2 (RB-3A-1) The unit measures 1.0 x 1.0 meters.

Lot 1 terminated 14 cm below datum. It consisted of a humus layer with black soil (10 YR 2/1). Recovered materials included ceramics, abundant chert flakes, obsidian fragments, animal bone, and shell.

Lot 2 terminated 33 cm below datum. It consisted of a fill layer with dark brown soil (10 YR 3/3). Recovered materials included ceramics, chert flakes, obsidian fragments, and shell. It contained several human bones from Burial 2.

Burial 2 (RB-3A-2, 3 and 4) Unit 2 measured 1.0 x 1.0 meters, Unit 3 measured .5 x .5 meters and unit 4 measured .5 x .5 meters. Based on the skeletal position from RB-3A-2-2, it was possible to create this diamond arrangement of excavations and simultaneously bring down the soil level to uniformly uncover the body.

Lot 1 of RB-3A-2 terminated 6 cm below datum. Lot 1 of RB-3A-3 terminated 13 cm below datum. Lot 1 of RB-3A-2 terminated 16 cm below datum. All consisted of a humus layer with black soil (10 YR 2/1). Recovered materials included ceramics, abundant chert flakes, obsidian fragments, animal bone, shell, and human bone.

Lot 2 of RB-3A-2 terminated 25 cm below datum. Lot 1 of RB-3A-3 terminated 28 cm below datum. Lot 1 of RB-3A-2 terminated 27 cm below datum. All consisted of a fill layer with dark brown soil (10 YR 3/3). Recovered materials included ceramics, obsidian fragments, animal bone, and human bone.

Lot 3 of RB-3-A-1, 2, 3 and 4 was designed for Burial 2, and contained both the burial itself, and all associated mortuary furniture, in particular a pair of intact vessels, but also sherds, chert flakes, animal bone, and large amount of shell.

Sub-operation B – Investigations off of Northeast Superplatform

This sub-operation was located off the northeast corner of the platform north of the site, and was designed to seek chronology and residential contexts.

(RB-3B-1) The unit measured 2 x 2 m and was oriented to match the site's structures, 30° east-of-north. It was hoped to be a living surface.

Lot 1 was a level of very dark grayish brown humus (10 YR 3/2) which terminated 17 cm below the level of the datum (SE). Cultural material emerged, including ceramic, obsidian, chert, jute shell, animal bone, figurines, and hematite. This may have been primary context of an actively used occupation area, but things did not appear to be in primary context. There were many gopher holes crossing the unit, especially coming out of the southern balk.

Lot 2 consisted of a black and small stone fill layer which was also primarily a humus layer (10 YR 2/1) and terminated 45 cm below the level of the datum. Lot 2 contained large quantities of ceramic, a point, a mano de metate and a figurine. It may have been a primary use surface. Other cultural materials, included obsidian, chert, and jute shell. Directly under it, two capstones of a burial emerged. They were drawn in situ and removed.

Lot 3 consisted of a very dark grayish brown layer (10 YR 3/2) under the humus and cap stones. It was designed to excavate the likely human interment. While teeth and skull fragments were found, the burial was completely destroyed by gopher damage. It was too disturbed to effectively excavate, and the decision was made to leave it in situ and re-bury it, ending the excavation of the unit. Ceramics, lithics, obsidian and shell were recovered in the process. The excavation terminated only 48 cm below the level of the datum. While the excavation failed to yield the burial in its entirety, the drawing and analysis of the capstones still provide useful data.

Operation 6 - Excavations Surrounding Platform D6-8 (Figures A.20 - A.30)

Sub-operation A – Investigations within the Looted South of ballcourt platform

In years past, platform D6-8 and structure D6-7 suffering from substantial looting damage. This sub-operation took place in this looted portion of the ballcourt structure in the Southern limit of the ceremonial core, complex D6-8. RB-6A-1 was a surface collection. RB-6A-3, 4, 5 and 6 were 2 x 2 excavation units.

(RB-6A-1-1) RB-6A-1-1 was the lot designation that was used to label surface collection of decontextualized materials, including unusual ceramics, and several pecked and ground stone artifacts, especially manos and metates.

RB-6A 3, 4, 5 and 6 were four directly articulated 2 x 2 meter units, oriented 30 degrees east-of-north in the southern limit of the ceremonial core by the D6-8 structural complex, a possible "ballcourt" structure. The D6-8 complex suffered heavy looting (6 x 8 meters approximately) with a backhoe before the PABC project began, and most of the southern structure (D6-7) has been destroyed and scraped to ground level. In the interest of preserving at-risk cultural remains close to this new ground surface, a 2 x 2 meter unit, RB-6A-3 was put into this looted zone. At level 4 of RB-6A-3, a burnt plaster floor (floor 1) was revealed in the eastern extent of the unit, leading to the opening of RB-6A-4 directly to the east to determine its nature and extent. In RB-6A-4 floor 1 was bound to the east by a large cut/soft sedimentary stone wall (Wall 1) oriented 30 degrees east-of-north. Opposite the sedimentary stone wall (wall 1), to the east, there was not an additional plaster floor, only object rich fill layers. This wall, as well as the plaster floor, continued south into the bulk of RB-6A-4.

RB-6A-5 was opened south of RB-6A-4 to determine whether how far wall 1 and floor 1 continued. The wall terminated and did not extend beyond RB-6A-5. RB-6A-6 was opened west of RB-6A-5 and south of RB-6A-3 to complete the 4 x 4 and determine the extent of floor 1. In both units the plaster wall seems that it may have continued further south, but the looting damage makes it impossible to be sure.

In RB-6A-3 and RB-6A-6, a single course stone wall (Wall 2) oriented 30 degrees east-of-north by the western limit of the units delimited floor 1 to the west. Opposite wall 2, to the west, a separate plaster floor (floor 2) in very poor condition was found. Overall, it appears that these plaster floors and low walls may represent a household or other kind of lived floor context, especially as a large number of manos and metates emerged from throughout the excavations in the D6-8 complex, as well as large numbers of ceramics. The overall nature of these features is hard to determine, not only because of their age, but because of damage from their exposure by the looting event. All these architectural features were found less than half a meter under the surface, at times only 10-20 cm. Indeed, wall 1 protrudes through the newly exposed surface, and was doubtlessly reduced in stature by the looting event.

Floor 1 was removed to determine the nature of underlying layers and recover material from at-risk "sealed" contexts. Several samples of the plaster were taken. Removing floor 1 revealed high quantities of fill stones, as well as an additional cut soft/sedimentary stone wall (wall 3) directly to the west and deeper than wall 1. Wall 1 and wall 3 likely articulated during an earlier building phase, and represent a pair of steps. The fill stones and plaster floor must have been added later, and covered wall 3 while utilizing wall 1 to limit the extent of the room or built space. An additional higher wall/step may have existed as well, but would have been obliterated in the process of looting.

To determine if any other building phases or steps could be found lower, the 2 x 1.5 m area on the east of the unit RB-6A-6 was excavated in its entirety (lots 8-13). While additional fill layers and jute rich materials were found before reaching bedrock, no additional floors, walls, or other architectural remains were recovered. These excavations ended at bedrock.

A 50 x 50 cm registro was excavated into the far southwestern limit of RB-6A-6 (lots 14-16) to explore whether any features existed under Floor 2. In this excavation, an additional floor was found (floor 3) which appeared to be largely intact. Its extent is unknown, but in represents a promising sealed context for which to target future excavations. Below, the specifics of each lot and associated recovered materials in RB-6A- 3, 4, 5 and 6 are described.

(RB-6A-3) Unit 3 measured 2 x 2 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located is an area of substantial looting, directly south of the remains of structure D6-7 in an area with relative little rubble.

Lot 1 was a level of very dark grayish brown soil (10 YR 2/1), a recent humus with abundant roots produced by the looting event. It terminated 27 cm below the level of the datum (Northwest Corner of the Unit). This lot contained ceramic, chert, animal bone and jute shell. Whereas the lot contained very few stones, it terminated at a far stonier level.

Lot 2 consisted of a stone collapse layer produced by the looting with a matrix of dark grayish brown soil (10 YR 4/2). It terminated 33 cm below the level of the datum. This lot contained ceramic, obsidian, jute shell and animal bones.

Lot 3 consisted of an additional collapse layer with a different colored matrix of stone and very dark grayish brown (10 YR 3/2) soil. It terminated 45 cm below the level of the datum. This lot contained ceramic, shell and animal bone.

Lot 4 consisted of a very dark grayish brown (10 YR 3/2) soil layer locate directly above a plaster floor which was located in the eastern part of the unit (floor 1), and a second floor (floor 2) located opposite a single course stone wall (wall 2) which separated these two floors. Floor 1 appeared to have been burnt and was extremely friable. Floor 2 was heavy destroyed as well, possibly from looting damage. This lot terminated at 53 cm below the level of the datum. It contained ceramic, chert, obsidian, jute shell and a piece of non-specular hematite.

Lot 5 consisted of the removal of floor 1, this continuation of excavation on the eastern extent of unit 3 being 2 meters north-south, but only 1.5 meters east-west, leaving floor 2 in the westernmost .5 m of the unit intact. It was a plaster and dark brown (10 YR 3/2) soil layer. It terminated on a layer of stony fill 56 cm below the level of the datum. It contained ceramic, chert, obsidian, jute shell and a piece of non-specular hematite. Samples of the floor plaster were also collected.

Lot 6 consisted of the removal of floor 2, this continuation being 2 meters north-south, but only 0.5 meters east-west, and considered separate from floor 2. In both lot 5 and 6, the wall dividing the two plaster floors was left intact. The soil and plaster fill in Lot 6 were grayish brown (10 YR 5/2). This lot terminated 68 cm below the level of the datum, and contained ceramics and jute shell.

Lot 7 consisted of the stony fill beneath floor 1, a continuation of the 2 meters north-south x 1.5 meters east-west subdivision of unit 3. It was excavated to recover materials from a "sealed" context to assist with dating the plaster floors. This fill contained a matrix of large stones and 10 YR 3/4 dark brown soil, and terminated 60 below the level of the datum. Lot 7 contained very abundant cultural artifacts, including ceramic, chert, obsidian, shell, worked shell, and many animal bones. The animal bones were primarily concentrated in the southeast corner of the unit, alongside large quantities of carbon, of which two samples were taken.

(RB-6A-4) Unit 4 measured 2 x 2 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located directly to the east of RB-6A-3, in the same area of substantial looting, directly south of the remains of structure D6-7. It was opened after lot RB-6A-3-4 revealed the presence of a semi-intact burnt plaster floor (floor 1) that extended east into the bulk of the unit. RB-6A-4 was designed to determine the extent of this plaster floor and document it before it was destroyed by exposure from looting of the D6-8 structural complex.

Lot 1 was a level of dark brown soil (10 YR 3/3), a recent humus produced by the looting event. It terminated 25 cm below the level of the datum (Northwest Corner of Unit 3). This lot contained ceramic, chert, and jute shell. Whereas the lot contained very few stones, it terminated at the beginning of a far stonier level.

Lot 2 consisted of a stoney collapse layer produced by the looting with a matrix of dark brown soil (10 YR 3/3). It terminated 32 cm below the level of the datum. This lot contained ceramic, obsidian, jute shell and animal bones. On its western half, it stopped directly over the burnt plaster floor (floor 1) which led to the opening of the new unit. The floor terminated at a sedimentary/friable stone wall, an usual light brown material which may also have been unfired clay. Opposite this wall to the east, there was no floor and only fill.

Lot 3 consisted of continuing excavations on the eastern extent of the unit opposite the friable stone wall. This continuation was 2 meters north-south, but only .8 meters east-west, leaving floor 1 in the western part of the unit intact. This layer consisted of very dark brown soil (7.5 YR 3/2) layer which terminated 54 cm below the level of the datum. This lot contained very substantial quantities of ceramic, shell, obsidian, chert and animal bone. With the high artifact count, and very dark soil, it seemed like a possible midden context.

Lot 4 consisted of the removal of floor 1, this continuation being 2 meters north-south, but only 1 meters east-west, terminating at wall 1 in the center of the unit. It was a plaster and dark brown (7.5 YR 3/2) soil layer. It terminated on a layer of stony fill 49 cm below the level of the datum. It contained ceramic, chert, obsidian, and jute shell. Samples of the floor were also collected.

Lot 5 consisted of the fill under floor 1, this continuation being the same 2 meters north-south and 1 meter east-west as Lot 4. It was a stony fill and dark brown soil (10 YR 3/3) fill layer. It terminated 53 cm below the level of the datum. Lot 5, as a sealed context, contained highly preserved and large ceramic sherds, as well as chert and jute shell. A carbon sample was also collected from this sealed context. A second wall of the same light brown friable stone or adobe wall (wall 3) was found under the floor, parallel to and lower than wall 1. This indicates that these may have been steps, initially, not walls. This also suggests stratified construction or occupation phases in this architectural complex.

Lot 6 consisted of a layer of fill under lot 5, this continuation being the same 2 meters north-south x 1 m east-west. This layer contained dark brown soil (7.5 YR 3/3) and terminated 63 cm below the level of the datum, and contained ceramics and jute shell. The change from lot 5 was induced by a dramatic increase in the number of intact pottery sherds. While it was at first thought they may represent an offering, excavation indicated it was simply a well preserved concentration of sealed materials. A single intact black ware sherd was found that represents approximately 30% of a bowl, along with many other ceramic sherds, animal bones, a piece of molded stucco, and shell.

Lot 7 consisted of cleaning of the rocks under Floor 1/Lot 4-6, and should be considered a continuation of these layers, but one that may contain materials which had fallen from higher levels after approximately a week of exposure. This fill contained a matrix of large stones and 7.5 YR 3/3 dark brown soil, and terminated 70 below the level of the datum. This Lot contained ceramic and shell.

(RB-6A-5) Unit 5 measured 2 x 2 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located directly to the south of RB-6A-4, in the same area of substantial looting, south of the remains of structure D6-7. It was opened after lot RB-6A-3-4 revealed the presence of a semi-intact burnt plaster floor (floor 1) and friable stone/adobe wall which extended south into the bulk of the unit. RB-6A-5 was designed to find the extent of this wall and plaster floor to document it before it was destroyed by exposure from looting of the D6-8 structural complex.

Lot 1 was a level of dark brown soil (10 YR 3/3), a recent humus layer produced by the looting event. It terminated 28 cm below the level of the datum (Northwest Corner of Unit 3). This lot contained highly eroded ceramic, chert, obsidian and jute shell. The lot contained very few stone and terminated at the beginning of a stonier level.

Lot 2 consisted of a stone collapse layer produced by the looting with a matrix of dark brown soil (10 YR 3/3). It terminated 38 cm below the level of the datum at the level of the floor. It revealed that wall 1 continued only approximately 50 cm to the south. This lot contained ceramic, chert, and jute shell.

Lot 3 consisted of continuing excavations on the eastern part of the unit opposite the friable stone wall, with dimensions of 2 meters north-south, and 1 meters east-west, leaving floor 1 in the western 1 m of unit 5 intact. It was designed to determine whether or not there was any wall or floor contexts opposite wall 1. This layer consisted of dark brown soil (10 YR 3/3) layer which terminated 47 cm below the level of the datum. No architectural features were found, and it is equivalent to the lot directly north, RB-6A-4-3. It contained ceramic, chert, obsidian and shell.

Lot 4 consisted of the removal of floor 1, this excavation taking place on the western half of the unit, with dimensions of 2 meters north-south, but only 1 meter east-west, terminating at wall 1 in the center of the unit. It was a plaster and dark greyish brown soil (10 YR 4/2) layer. It terminated on a layer of stony fill 50 cm below the level of the datum. It contained ceramic, chert and jute shell.

Lot 5 consisted of the fill under floor 1, this continuation being the same 2 meters north-south and 1 meter east-west as Lot 4. It was a stony fill and dark brown soil (10 YR 3/3) fill layer. It terminated 55 cm below the level of the datum. Lot 5 contained relatively preserved ceramic sherds, as well as chert, jute shell and animal bone. This unit suffered the most from the looting damage in structure D6-8, and damage to the architectural features makes the context of the ceramics uncertain.

(RB-6A-6) Unit 6 measured 2 x 2 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located directly to the south of RB-6A-3, and east of RB-6A-5 in the same area of substantial looting, directly south of the remains of structure D6-7. It was to determine the full extent of the large burnt plaster floor (floor 1), the small unburnt plaster floor (floor 2) and the stone wall (wall 2) that existed in RB-6A-3. It also completed the 4 x 4 meter zone of excavation opened by units 3, 4 and 5.

Lot 1 was a level of very dark brown soil (10 YR 2/2), a recent humus produced by the looting event with many roots. It terminated 51 cm below the level of the datum (Northwest Corner of Unit 3). This lot contained ceramic, chert, obsidian, animal bone and jute shell.

Lot 2 consisted of a stone collapse layer produced by the looting with a matrix of large stones and very dark grayish brown soil (10 YR 3/2). It terminated 53 cm below the level of the datum. This lot contained abundant cultural materials, including ceramic, chert, stucco, a pecked stone mano de metate, animal bone and jute shell.

Lot 3 consisted of an additional collapse layer with very dark grayish brown (10 YR 3/2) soil. It terminated 58 cm below the level of the datum on at the level of stucco floor 2, in the western half the unit. Floor 1, as well as wall 2 also emerged in this level. This lot contained ceramic, shell and animal bone.

Lot 4 consisted of the removal of floor 1, in the eastern half of the unit, this continuation being 2 meters north-south, but only 1.5 meters east-west and delimited by the stone wall (wall 2). It was a layer of plaster and very dark grayish brown (10 YR 3/2) soil. it left floor 2 intact. This lot terminated at 56 cm below the level of the datum, directly above floor 1, and confirmed the role of wall 2 in Unit 6 in delimiting the burnt plaster floor. It contained ceramic, chert, obsidian and jute shell.

Lot 5 consisted of the removal of floor 2, this continuation being 2 meters north-south, but only 0.5 meters east-west on the western side of the unit. The soil and plaster fill in Lot 5 were grayish brown (10 YR 5/2). This lot terminated 64 cm below the level of the datum, and contained ceramics and jute shell.

Lot 6 consisted of the fill under floor 1, this continuation being the same 2 meters north-south by 1.5 meters east-west as lot 4. It was a stony fill and dark brown (10 YR 3/2) soil layer. It 64 cm below the level of the datum. Lot 6 contained abundant cultural materials, including ceramic, chert, obsidian, jute shell, animal bone, and an unusual black stone. This sealed layer also contained abundant carbon, of which a sample was taken.

Lot 7 consisted of a continuation of the stony fill beneath floor 1, a continuation of the 2 meters north-south x 1.5 meters east-west subdivision of unit 3. It was excavated to recover more materials from a "sealed" context. This fill contained a matrix of large stones and dark brown (10 YR 3/3) soil, and terminated 61 below the level of the datum. Lot 7 contained very abundant cultural artifacts, including ceramic, chert, shell, worked bone, many animal bones and more of the unusual black stone.

Lot 8 was a thorough cleaning of the stone fill from lot 7. The fill was the same dark brown soil, (10 YR 3/3) and terminated 72 cm below the level of the datum. Lots 6-8 can be considered the same overall context. Many cultural materials emerged, including ceramic, chert, obsidian, shell, bone, stucco, imported shell, quartz, clay, hematite, and a possible drilled bead. Carbon samples were also recovered.

Lot 9 was under lot 8 and consisted of the fill stones from beneath floor 1 in Unit 6A-6. It contained dark brown (10 YR 7.5 3/3) soil with large stones and terminated 87 cm below the level of the datum at a fill layer of small stones. It contained a very high quantity of carbon, of which several samples were taken. The quantity of ceramics was also quite high, alongside chert, obsidian, shell and animal bone.

Lot 10 was a carbon sample collection from a possible posthole in plaster floor 2, taken from the northwest corner of the unit.

Lot 11 was located under lot 9, and consisted of small stones and a very dark grayish brown soil (10 YR 3/2) of fill, and terminated 94 cm below the level of the datum. It contained very few cultural materials, only a few ceramic sherds along with shell.

Lot 12 was a continuation of these excavations, and consisted of a dark grayish brown very soft soil layer (10 YR 4/2). It terminated 86 cm below the level of the datum. It contained abundant shell and very little cultural materials, only 4 ceramic sherds.

Lot 13 was a continuation of these excavations, and was a non-anthropogenic layer. It consisted of very hard light grey (10 YR 7/2) rock and terminated 104 cm below the surface. It contained no cultural materials, and many jute shells.

Lot 14 consisted of a registro excavated in the far southwestern limit of the unit into the fill under floor 2. The dimensions of this registro were 50 x 50 cm. It was designed to determine if there were additional architectural phases or materials in the D6-8 architectural complex which were at risk from the looting event. Lot 14 was the plaster from floor 2 along with a dark brown (10 YR 3/3) soil layer. It confirmed that floor 2 was a poorly preserved plaster floor. The fill layer terminated at the level of an additional intact plaster floor (Floor 3), 72 cm below the level of the datum.

Lot 15 was directly under lot 14, in the same 50 cm x 50 cm area. It consisted of the intact plaster floor (floor 3) and the fill from directly beneath it, and terminated 92 cm below the level of the datum. Unfortunately, despite its sealed and early context, it contained very few artifacts, only a few ceramic sherds and shell. Samples of the stucco floor were taken.

Lot 16 was under Lot 15 in the same 50 x 50 cm area. It consisted of a natural level of light grey (10 YR 7/2) hard stone. It contained only jute shell, and terminated at a level of bedrock 110 cm below the level of the datum. As described above, these excavations may be from an early household context. They demonstrate the stratified nature of occupations at Rancho Búfalo, including superimposed sealed plaster floors. This indicates the potential for future research in this area of the site, especially in attempting to establish a firm ceramic occupation chronology.

Sub-operation B – Looters Pit in D6-7

This sub-operation was the cleaning of a looter's pit in the D6-7 structure. Its excavations were designed to determine construction phases in the building while consolidating this damage.

(RB-6B-1) Unit 1 was the cleaning of the floor in the looters trench. It was excavated 10 cm to determine whether the plaster seen in the pit may have comprised an intact stucco floor. Unfortunately it was found to only be distributed stucco from the looting damage, not occupation phases in the structure. Many artifacts were recovered during this cleaning, including ceramic, chert, obsidian, and shell.

(RB-6B-2) Unit 2 was the cleaning of the stones in profiles of the looters trench.

Lot 1 was the north profile. It measured 2.07 m in width and 1.67 m in height. Abundant cultural materials emerged, including ceramic, chert, obsidian and shell. Unfortunately, no clear construction layers were apparent in the profile.

Lot 2 was the west profile of the looters trench, and measured 1.5 m in width and 1.5 m in height. Ceramic, chert and shell emerged. Unfortunately, as with Lot 1, no clear construction layers were apparent in the profile. One of the sherds was a decorated Early Classic sherd with an incised depiction of the feathered serpent.

Sub-operation C – Excavations East of D6-8 Platform

(RB-6C-1) Unit 1 measured 2 x 2 m, and was located to the east of platform D6-8, and oriented 30° east-of-north to match the line of the site's structures. It was designed to determine the occupation history of D6-8 and was positioned in hopes of finding the extent of the structure by coming down on top of the platform wall. As it was located in front of a putative staircase, it was also the possible location for an offering.

Lot 1 was a level of black humus (7.5YR 2.5/1) which terminated 12 cm below the level of the datum (Northeast Corner). The unit was on an east to west inclined caused by its location on the structure's collapse. Several large stones were present, likely collapse from the D6-8 platform and the D6-6 and D6-7 superstructures. Much cultural material emerged, included eroded ceramic, chert (including possible cores and production debitage), obsidian, jute shell and animal bone.

Lot 2 consisted of black soil layer (7.5 YR 2/1) of collapse and terminated 44 cm below the level of the datum. This collapse also came from the platform and structure so the D6 platform. There were large structural stones, but also many small stones of possible fill. Lot 2 contained a very large amount of cultural materials, enough to be suggestive of a midden. This included well ceramic, chert, obsidian, pecked stone metates (which may have been reused as construction materials and are now part of the structural collapse) shell and bone.

Lot 3 consisted of a very dark brown soil layer (7.5 YR 2.5/3) of fill with fewer stones. This level terminated 46 cm below the level of the datum. It also contained an usually large amount of ceramic, chert, obsidian, jute shell and animal bone.

Lot 4 was also a very dark brown soil layer (7.5 YR 2.5/3), with the transition mediated by a possible level of eroded stucco. It terminated 49 cm below the level of the datum. Lot 4 contained slightly lower quantity of ceramic, chert, obsidian, quartz, jute shell, imported shell and animal bone.

Lot 5 was a very dark brown soil layer (7.5 YR 2.5/3). It terminated 70 cm below the level of the datum. It contained many cultural material as well. Though not in as high quantities as in Lots 3 and 4, the ceramic and chert were better preserved. The quantity of shell and bone is still as high as the upper lots. Lot 5 terminated with an increase in stones, as well as a layer of possible stucco which could represent a destroyed plaster floor.

Lot 6 was a very dark brown soil layer (7.5 YR 2.5/3) of fill with many more stones. It terminated 79 cm below the level of the datum. It contained stucco, ceramic, chert, obsidian, animal bone and shell.

Lot 7 was a layer of dark yellowish brown soil (10 YR 4/6) which contained very high levels of stucco. It terminated 94 cm below the level of the datum. While it was still too destroyed for it to be a definitive plaster floor, it is possible, especially given the associated soil color change. The lot contained ceramic, chert, shell, bone and several metate fragments.

Lot 8 consisted of a dark yellowish brown (10 YR 4/6) soil matrix with several small stones interspersed, and terminated 110 cm below the level of the datum. Four small pieces of stucco also emerged in this layer, perhaps indicating the remains of a destroyed plaster floor. In this lot, the number of jute shells increased dramatically, and the number of cultural artifacts decreased. There were ceramics, chert, shell and bone. If this is an anthropogenic layer, represents a likely transition in subsistence type, to a higher reliance on shell.

Lot 9 was also a of layer of dark yellowish brown (10 YR 4/6) soil, except it contained many medium stones. It terminated 127 cm below the level of the datum. This lot was similar in composition to Lot 8, and also has a large quantity of shell, and a low number of cultural artifacts. It only contained ceramic, shell and bone.

Lot 10 was a layer of dark yellowish brown (10 YR 4/6) soil that terminated 127 cm below the level of the datum. It was marked by the presence of a uniform floor of shell. The concentration was especially abundant in the Southeast and Southwest corners, but extended throughout the entire unit. There was still a low concentration of cultural materials in Lot 10, but in addition to ceramic and jute shell, there were obsidian and chert lithic tools.

Lot 11 was a layer of dark yellowish brown (10 YR 4/4) soil with a high quantity of shell, but not in such dramatic and consistent concentrations as in lot 10. There was also a few possible pieces of stucco. It terminated 142 cm below the level of the datum. There was ceramic obsidian, shell and bone, but in dramatically lower quantities.

Lot 12 was a layer of dark yellowish brown soil (10 YR 4/4) soil that terminated 147 cm below the level of the datum. It terminated at the level of a white and very durable bedrock. It contained a low number of ceramics and chert, as well as many jute shells. In addition, it contained a single ceramic ball approximately 4 cm in diameter which was directly on the bedrock surface. This represents a possible offering, and may indicate that the bedrock was scraped or leveled before these occupation layers were produced. While the limits of the D6 platform were not found, the well stratified layers and possible bedrock manipulation in this unit provide critical information about the occupation chronology, as well as the nature of construction at Rancho Búfalo. Similarly, this area's midden-like remains are quite fascinating given its central location. There is a possibility this was a locale for the deposit or ritualized refuse, including feasting remains and high-quality ceramics. Laboratory analysis will confirm or deny this possibility.

Sub-operation D – Surface collection on top of D6-8 Platform

(RB-6D-1) This operation contained only one lot. This year, a small collapsed round structure, or perhaps a collapsed bench, was found in the center of the D6-8 platform between D6-6 and

D6-7 in the center of the possible "ballcourt". It was cleared of brush and mapped. Several sherds emerged, and this surface collection was designated lot RB-6D-1-1.

Sub-operation E – Excavations west of D6-8 Platform

(RB-6E-1) Unit 1 measured 1 x 1 m. It was located to the west of platform D6-8 and was oriented to match the line of the site's structures, 30° east-of-north. It was designed to determine the occupation history of the structure and was positioned in hopes of finding a wall of the platform. to helped determine the extent and design of Rancho Búfalo's settlement.

Lot 1 was a black humus layer (10 YR 2/1) which terminated 14 cm below the level of the datum (Southwest Corner). The unit on a west to east incline generated by the D6-8 platform's collapse collapse. Much cultural material emerged, included eroded ceramic, chert, obsidian, jute shell, animal bone and red hematite.

Lot 2 consisted of very dark brown soil and stone layer (10 YR 2/2) of collapse and terminated 44 cm below the level of the datum. It is likely collapse from the platform and structure so the D6 platform. There are both large and small stones. It contained ceramic, chert, obsidian, animal bone and shell.

Lot 3 consisted of a dark brown soil layer (10 YR 3/3) of fill with no stones. This level terminated 67 cm below the level of the datum. If lot 2 is a collapse layer, Lot 3 may be an encapsulated layer of humus dating to the time of occupation. It contained ceramic, chert, obsidian, jute shell and animal bone.

Lot 4 was also a layer of dark brown soil (10 YR 3/3), but it is a fill layer with many small stones. It terminated 88 cm below the level of the datum. Lot 4 contained ceramic, chert, obsidian, quartz, jute shell, imported shell and animal bone.

Lot 5 was a layer hard yellow soil or friable stone (10 YR 6/2). It terminated 125 cm below the level of the datum on the level of bedrock. It contained very few cultural materials, but trace amounts of ceramic, chert, shell and bone.

Sub-operation F – Horizontal Excavations on top of D6-8 Platform

The sub-operation was designed to investigate the collapsed structure in the center of the ballcourt playing alley of the D6-8 platform. The objective of the excavations was to explore the Classic Period reoccupation of the site. It employed a series of articulating 1 x 1 units in a grid pattern, all of which were excavated (1, 2, 3, 4, 7, 8, 9, 10, 12). Two units (5 and 6) were laid down 1.50 m west in an effort to determine whether there were materials beyond the collapsed structure. All units consisted of a single lot.

(RB-6F-1) Unit 1 consisted of a level of humus with collapse, with very dark brown soil (10 YR 2/2). It terminated 7 cm below the level of the datum. It contained ceramic, shell, chert, animal bone, obsidian, and a small greenstone *hacha*.

(RB-6F-2) Unit 2 consisted of a level of humus with collapse, with very dark brown soil (10 YR 2/2). It terminated 12 cm below the level of the datum. It contained ceramic, shell, chert, the head of a figurine, animal bone, obsidian, quartz, and a *metate*.

(RB-6F-3) Unit 3 consisted of a level of humus with collapse, with very dark brown soil (10 YR 2/2). It terminated 7 cm below the level of the datum. It contained ceramic, shell, chert, animal bone and obsidian.

(RB-6F-4) Unit 4 consisted of a level of humus with collapse, with very dark brown soil (10 YR 2/2). It terminated 7 cm below the level of the datum. It contained ceramic, shell, chert, animal bone and obsidian.

(RB-6F-5) Unit 5 consisted of a level of humus with collapse, with very dark brown soil (10 YR 2/2). It terminated 6 cm below the level of the datum. It contained ceramic, shell, chert, animal bone and obsidian.

(RB-6F-6) Unit 6 consisted of a level of humus with collapse, with very dark brown soil (10 YR 2/2). It terminated 9 cm below the level of the datum. It contained ceramic, shell, chert, animal bone and obsidian.

(RB-6F-7) Unit 7 consisted of a level of humus with collapse, with very dark brown soil (10 YR 2/2). It terminated 6 cm below the level of the datum. It contained ceramic, chert, and obsidian.

(RB-6F-8) Unit 8 consisted of a level of humus with collapse, with very dark brown soil (10 YR 2/2). It terminated 6 cm below the level of the datum. It contained ceramic, shell, chert and obsidian.

(RB-6F-9) Unit 9 consisted of a level of humus with collapse, with very dark brown soil (10 YR 2/2). It terminated 10 cm below the level of the datum. It contained ceramic, shell, animal bone and obsidian.

(RB-6F-10) Unit 10 consisted of a level of humus with collapse, with very dark brown soil (10 YR 2/2). It terminated 14 cm below the level of the datum. It contained ceramic, shell, chert, animal bone and obsidian and waddle and daub.

(RB-6F-12) Unit 12 consisted of a level of humus with collapse, with very dark brown soil (10 YR 2/2). It terminated 13 cm below the level of the datum. It contained ceramic, shell, chert bone and obsidian.

With the excavation of 6F, it was possible to determine that the possible round altar could be more accurate characterized as a collapsed foundation of a superstructure. A rectangular form existed among the units, and these linear walls were likely the base of a Classic Period occupation, based on field typing.

Operation 7 - Excavations Surrounding Structure E6-1 (Figures A.31 - A.33)

Sub-operation A – Excavations Between E6-1 and E6-2

(RB-7A-1) Unit 1 measured 1 x 1 m, and was located between structures E6-1 and E6-2. It was designed to determine the occupation history of the structure and was positioned in hopes of finding a wall of one of the associated platforms. It was also designed to find the actual orientation of the structures. Despite the apparent orientation of the rest of the site 30° east-of-north, this pair of structures seemed it may have been oriented 15° east-of-north. In addition to determining the extent and design of settlement, finding a wall would confirm or deny the possible orientation of the structure. It was dug after Operation 7A failed to find any intact architecture.

Lot 1 was a level of very dark brown humus (10 YR 2/2) which terminated 11 cm below the level of the datum (Southeast Corner). There were abundant roots in this layer. A small amount of cultural material emerged, included eroded ceramic, chert, and jute shell.

Lot 2 consisted of dark brown soil (10 YR 3/3) and terminated 33 cm below the level of the datum to the north, and 43 cm to the south. It may represent an older layer of humus or wash from the structure. It contained a larger amount of cultural material, including ceramics, chert, obsidian, animal bone and shell. It terminated in an uneven lens of rocky fill, which did not cover the entire layer, and declined in altitude as it moved further from the structure.

Lot 3 was a lens of stony collapse within the same dark brown soil matrix (10 YR 3/3). This level terminated at a leveled layer of fill soil. If this is a level of collapse from the structure, then the underlying level is possibly the final in-site occupation level of humus. This level terminated 46 cm below the level of the datum. There were abundant cultural materials, including ceramic, chert, obsidian, stucco as well as jute shell and animal bone. The jute and animal bone did not show evidence of working.

Lot 4 was also a layer of dark brown soil (10 YR 3/3) of fill with no stones. It terminated 76 cm below the level of the datum. There were ceramics and shell in this layer.

Lot 5 was a layer of dark grayish brown soil (10 YR 3/3), and contained several fill stones, though not a contiguous layer of them. It terminated 114 cm below the level of the datum. It contained only ceramic and jute shell.

Lots 6 and 7 were adjacent to one another, and consisted of different colored soft soil fill. Lot 6, on the northern half of the unit, was a light grey (2.5 YR 7/2) soil with no cultural materials. It terminated 125 cm below the level of the datum. South of the lot was lot 7, a pale brown (10 YR 6/3) soft soil layer with abundant ceramic and shell. It terminated further down than lot 6, at 157 cm below the level of the datum. No stones emerged from either of these layers, but their relationship or anthropogenic nature is not clear. Further excavations will be needed to determine whether it may represent early levels of earthen architecture.

Both layers ended in a hard bedrock of very pale brown (10 YR 8/2) which contained no cultural materials. While no materials were found, the unusual composition of lots 6 and 7 may indicate the use of earthen architecture at the earliest phases of Rancho Búfalo's occupation.

Sub-operation B – Excavations West of E6-1

(RB-7B-1) Unit 1 measured 1 x 1 m, and was located to the west of structure E6-1. It was designed to determine the occupation history of the structure and was positioned in hopes of finding a wall to determine the extent of its associated platform. It was also designed to determine the orientation of the structures. Despite the orientation of the rest of the site 30° east-of-north, the E6 structural complex appeared to be oriented 15° east-of-north based on surface mound morphology. In addition to determining the extent and design of settlement, finding a wall could confirm the orientation of the structure.

Lot 1 was a layer of black humus (10 YR 2/1) which terminated 10 cm below the level of the datum (Southwest Corner). A small amount of cultural material emerged, included eroded ceramic, chert, jute shell and animal bone.

Lot 2 consisted of very dark brown soil layer (10 YR 2/2) and terminated 19 cm below the level of the datum. It may represent an older layer of humus or wash from the structure. It contained a larger amount of cultural material, including ceramics, chert, obsidian, animal bone and shell.

Lot 3 consisted of a dark brown soil layer (10 YR 3/3) of fill with many small stones. This level terminated at the level of a possible wall, with roughly hewn stones oriented 30° east-of-north. This level terminated 52 cm below the level of the datum. There were abundant cultural materials, including ceramic, chert, obsidian, stucco as well as jute shell and animal bone. The jute and animal bone did not show evidence of working.

Lot 4 was also a layer of dark brown soil (10 YR 3/3) of fill with many small stones. It was an artificial transition to recover material directly in front of the wall in a separate level from the fill above. Continued excavation found one additional course of cut stone below Lot 3, confirming its identity as a platform wall. The level continued below the level of apparent cut stone, and terminated in what may have been a stucco floor. It terminated 110 cm below the level of the datum. There were abundant cultural materials, including ceramic, chert, obsidian, stucco, jute shell and animal bone.

Lot 5 was a layer of dark brown soil (10 YR 3/3), but continued no fill stones. There was no additional evidence of architecture, and terminated 140 cm below the level of the datum. It contained somewhat less cultural materials, including ceramics, chert, jute shell and bones.

Lot 6 was had a change in the quality of soil to a dark greyish brown matrix (10 YR 4/2), and still contained no apparent fill stones. It contained little cultural materials, including ceramics, chert and jute shell. It terminated in a grey friable stone layer with no apparent cultural materials.

Lot 7 was a durable light grey (10 YR 7/2) friable stone with no cultural materials. It may be a natural layer. It did contain some jute, as well as bone, which may or may not be anthropogenic. There was not working on either the bone or shell. Continuing excavations following the wall of the platform will allow us to guide further excavations and work out the extent of the structure as well as the design of the E6-1 and E6-2 dual structure complex.

Operation 8 - Excavations Surrounding Structure D6-5 (Figures A.34 - A.45)

Sub-operation A – Excavations North of D6-5

This sub-operation was part of the excavation of the wall of platform D6-5, and was excavated in both 2012 (Unit 1) and 2013 (all other units). Unit 3 was excavated 10 meters to the west of unit 8A-2, in an effort to see if the platform being excavated continued to also hold structure D6-3. All units were oriented to match the site's structures, 30° east-of-north. Excavation of unit 3 quickly confirmed that the platform did not continue, but also came down on an unusual crypt formation and burial. It was decided that, despite not meeting the original sub-operation goals of exploring the D6-5 platform, excavations would continue in and around D6-3, in a separate set of units designed to explore this formation (3, 9, 10, 13). The other units (1, 2, 4, 5, 6, 7, 8, 12) articulate with the D6-5 wall.

(RB-8A-1) Unit 1 measured 1 x 1 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located directly north of the corner of structure D6-5 in the D6 structural complex. It was designed to determine the occupation history of the structure and was positioned in hopes of finding either a corner or wall of this platform.

Lot 1 was a level of black humus (7.5 YR 2.5/1) which terminated 5 cm below the level of the datum (Southeast Corner). A small amount of cultural material emerged, included some eroded ceramic, obsidian, chert, jute shell and animal bone.

Lot 2 consisted of a dark reddish brown soil and collapse layer under the humus layer (10 YR 2/2) and terminated 18 cm below the level of the datum. In the Southern bulk of the unit, several cut stones began to emerge oriented 30° east-of-north. These appear to represent the wall of the platform D6-5. Several stones also emerged from the center of the unit, but these were not articulated. These were stones from collapse. Lot 2 contained cultural materials, including ceramics, chert, quartz, animal bone and shell.

Lot 3 consisted of a dark reddish brown soil matrix (5 YR 3/4) of fill with many small fill stones. The wall in the Southern bulk of the unit also continued, with at least one additional course of cut stone. This level terminated 52 cm below the level of the datum. There were abundant cultural materials, including ceramic, chert, obsidian and stucco as well as jute shell and animal bone. The jute and animal bone did not show evidence of working.

Lot 4 was a level reddish brown (5 YR 3/3) soil. It continued below the level of the platform wall, however, the transition was not clearly delimited at the time of excavation, and the resulting material represents a mixed lot of both cultural material associated with the wall, and cultural materials that come from the layer beneath it. It terminated 72 cm below the level of the datum. There were abundant cultural materials, including ceramic, chert, obsidian, jute shell and animal bone.

Lot 5 was a very thin level of reddish brown soil (2.5 YR 4/3) with abundant jute shell that terminated 86 cm below the level of the datum. It may represent a natural layer that predates the human occupation. It contained no cultural materials, and the shells did not show clear evidence of working or consumption.

Lot 6 was a layer of reddish grey (2.5 YR 5/1) friable rock that terminated 96 cm below the level of the datum at bedrock. It also contained a large amount of jute. It contained a few eroded ceramic sherds, but these may have fallen from the bulk, especially during the cleaning of the wall for photos and drawing. It likely also represents a natural level. Continuing excavations in the plaza will better determine deliminate this stratigraphy. It is critical that 8A-1-1 contained the wall of the platform, as this will allow us to guide further excavations to determine the extent of the structure and the location of centerlines.

(RB-8A-2) Unit 2 was the first unit to be excavated in 2013, 2 meters to the west of unit 8A-1 where the D6-5 platform wall was found. It measured 1 x 2 meter and was placed specifically to locate whether the D6-5 platform wall continued. It was oriented at 30° east-of-north.

Lot 1 was a level of black humus (10 YR 2/2) with a matrix of many roots and soil. It terminated 26 cm below the level of the datum. Cultural material included some eroded ceramic, obsidian, chert flakes, jute shell, obsidian, and a small vegetal fossil.

Lot 2 was a level of collapse surrounded by dark brown-yellow soil (10 YR 4/4). It terminated 57 cm below the level of the datum. Cultural material included some eroded ceramic, jute shell, chert flakes, animal bone, and obsidian.

Lot 3 was a level of the wall of D6-5, with the limestone surrounded by a matrix of brown soil (10 YR 4/3). It terminated 83 cm below the level of the datum. Cultural material included ceramic, jute shell, and a grinding stone.

(RB-8A-4) Unit 4 was placed directly to the west of unit 8A-2 to continue along the D6-5 platform wall. It measured 1 x 2 meter and was oriented at 30° east-of-north.

Lot 1 was a level of dark black humus (10 YR 2/1) with a matrix of many roots and soil. It terminated 27 cm below the level of the datum. It came down immediate on a curved corner of the platform. Cultural material included ceramic, obsidian, jute shell, and chert.

Lot 2 was a level of fill with dark brown soil (10 YR 3/3). It terminated 46 cm below the level of the datum. Cultural material included some eroded ceramic, jute shell, chert flakes, animal bone, and obsidian.

Lot 3 was a fill layer with a matrix of yellow brown soil (10 YR 3/4). It terminated 51 cm below the level of the datum. Cultural material included ceramic, jute shell, chert flakes, and obsidian.

Lot 4 was a layer of small stones with larger blocks, surrounded by a matrix of dark brown soil (10 YR 3/3). It terminated at bedrock. Cultural material included shell, ceramic, and obsidian.

(RB-8A-5) Unit 5 was placed directly to the south of unit 8A-4 to continue along the D6-5 platform wall and reveal the corner. It measured 1.5 x 2 meter and was oriented at 30° east-of-north.

Lot 1 was a level of black humus (10 YR 3/1) with a matrix of many roots and soil. It terminated 14 cm below the level of the datum. Cultural material included ceramic, shell, chert, and obsidian.

Lot 2 was a level of fill with small stones and dark brown soil (10 YR 3/3). It terminated 25 cm below the level of the datum. Cultural material included some ceramic, shell, chert flakes, animal bone, obsidian and quartz.

Lot 3 was a fill layer with a matrix of very dark brown soil (10 YR 2/2). It terminated 53 cm below the level of the datum, aligned with the D6-5 wall and onto a possible floor. Cultural material included ceramic, jute shell, chert flakes, and animal bone.

Lot 4 was a layer of small stones with larger blocks, surrounded by a matrix of dark brown soil (10 YR 3/3). It terminated 77 cm below datum at bedrock. Cultural material included shell, ceramic, chert flakes, and animal bone.

(RB-8A-6) Unit 6 was placed directly to the south of unit 8A-5 to continue along the D6-5 platform wall and reveal the corner. It measured 1 x 1 meter and was oriented at 30° east-of-north.

Lot 1 was a level of grey-black humus (10 YR 3/2) with a matrix of many roots and soil. It terminated 15 cm below the level of the datum. Cultural material included ceramic, shell, chert, and obsidian.

Lot 2 was a level of fill with small stones and dark brown soil (10 YR 3/3). It terminated 29 cm below the level of the datum. Cultural material included ceramic, shell, chert flakes, and obsidian.

Lot 3 was a fill layer with a matrix of small stones and yellow-brown soil (10 YR 2/2). It terminated 50 cm below the level of the datum. Cultural material included ceramic, jute shell, chert flakes, and animal bone and obsidian.

Lot 4 was a layer of small stones with larger blocks, surrounded by a matrix of dark brown soil (10 YR 3/3). It terminated 82 cm below datum at bedrock. Cultural material included shell, ceramic, obsidian, and animal bone.

(RB-8A-7) Unit 7 was placed directly to the south of unit 8A-6 to continue along the D6-5 platform wall and reveal an additional corner and the continuation of the wall. It measured 1 x 2 meter and was oriented at 30° east-of-north.

Lot 1 was a level of grey-black humus (10 YR 3/2) with a matrix of many roots and soil. It terminated 15 cm below the level of the datum. A series of well worked rocks immediately emerged within the wall. Cultural material included ceramic, shell, chert, and obsidian.

Lot 2 was a level of fill with small stones and brown soil (10 YR 3/4). It terminated 24 cm below the level of the datum. Cultural material included ceramic, shell, chert flakes, and obsidian.

Lot 3 was a fill layer with a matrix of small stones and brown soil (10 YR 4/3). It terminated 79 cm below the level of the datum. This level revealed the well form, talud-like, wall. Cultural material included ceramic, jute shell, animal bone and obsidian.

Lot 4 was a layer of small stones with larger blocks, surrounded by a matrix of dark brown soil (10 YR 3/3). It terminated 83 cm below datum at bedrock. Cultural material included shell, ceramic, chert blades, obsidian, and animal bone.

Lot 5 was a separate context in the southeast of the unit based on an intact plaster floor that was found. It consisted of a fill layer dark brown soil (10 YR 3/3) immediately above bedrock. It terminated 79 cm below datum. Cultural material included shell, ceramic and chert blades.

(RB-8A-11) Unit 11 was placed directly to the south of unit 8A-7 to continue along the D6-5 platform wall. It measured 1 x 1 meter and was oriented at 30° east-of-north.

Lot 1 was a level of very dark brown humus (10 YR 2/2) with a matrix of many roots and soil. It terminated 25 cm below the level of the datum. A series of well worked rocks immediately emerged within the wall. Cultural material included ceramic, shell, chert, and quartz.

Lot 2 was a level of collapse with limestone blocks and brown soil (10 YR 4/3). It terminated 34 cm below the level of the datum. The line of the wall emerged at this level. Cultural material included ceramic, shell, chert flakes, animal bone and obsidian.

Lot 3 was a fill layer with a matrix of small stones and brown soil (10 YR 3/3). It terminated 50 cm below the level of the datum at the level of a barely preserved plaster floor. Cultural material included ceramic, jute shell, animal bone and obsidian and a quartz polishing stone.

Lot 4 was a layer of small stones with larger blocks, surrounded by a matrix of dark brown soil (10 YR 3/3). It terminated 94 cm below datum at bedrock. Cultural material included shell, ceramic, chert blades, chert, obsidian, and animal bone.

(RB-8A-12) Unit 12 was placed directly to the south of unit 8A-11 to continue along the D6-5 platform wall and reveal an additional corner and the final continuation of the wall. It measured 1 x 2 meter and was oriented at 30° east-of-north.

Lot 1 was a level of black humus (10 YR 2/1) with a matrix of many roots and soil. It terminated 21 cm below the level of the datum. A series of well worked rocks immediately emerged within the wall. Cultural material included ceramic, shell, chert, animal bone and obsidian.

Lot 2 was a level of fill with small stones and very dark brown soil (10 YR 2/2). It terminated 22 cm below the level of the datum. Cultural material included ceramic, shell, chert flakes, animal bone, quartz and obsidian.

Lot 3 was a fill layer with a matrix of small stones and very dark brown soil (10 YR 2/2). It terminated 52 cm below the level of the datum. This level revealed the form of the talud-like, wall, as well as a final corner with a right angle. Cultural material included ceramic, jute shell, chert and animal bone.

Lot 4 was a layer of small stones surrounded by a matrix of dark brown soil (10 YR 3/3). It terminated 88 cm below datum at bedrock. Cultural material included shell, ceramic, chert blades, obsidian, and animal bone.

Lot 5 was a separate context in the southeast of the unit based with a very dark soil discoloration, perhaps at a point of offering or burning (10 YR 2/1). A *registro* was taken of it, a small amount of ceramic and shell were recovered. It terminated 97 centimeters below the level of the datum.

(RB-8A-14) Unit 14 was placed directly to the south of unit 8A-12 to continue along the D6-5 platform wall and revealed a final additional corner and the end of the wall, terminating at a possible step. It measured 1 x 1 meter and was oriented at 30° east-of-north.

Lot 1 was a level of black humus (10 YR 2/1) with a matrix of many roots and soil. It terminated 15 cm below the level of the datum. A series of well worked rocks immediately emerged within the wall. Cultural material included ceramic, shell, chert and animal bone.

Lot 2 was a level of fill with small stones and very dark brown soil (10 YR 2/2). It terminated 30 cm below the level of the datum, at the line of stones composing the wall. Cultural material included ceramic, shell, chert flakes, animal bone, and obsidian.

Lot 3 was a fill layer with a matrix of small stones and very dark brown soil (10 YR 2/2). It terminated 46 cm below the level of the datum. This level revealed the form of the talud-like, wall, as well as that there were not additional corners. Cultural material included ceramic, jute shell, chert and quartz.

Lot 4 was a layer of small stones surrounded by a matrix of brown soil (10 YR 3/3). It terminated 72 cm below datum at a soil change to an orange color. This was the lowest level of the wall; it was clear an additional lot continued beneath the layer before bedrock. Cultural material included shell, ceramic, and animal bone.

Lot 5 was a context below the level of the wall with a black color evocative of carbon, though featuring orange highlights (10 YR 2/1). This was present primarity in the north portion of the unit, extending into 8A-12-5. A small amount of ceramic and shell were recovered. It terminated 102 centimeters below the level of the datum.

The archaeological excavations on the D6-5 platform revealed much of the morphology of the structure, including a complex compound corner, and that there may have been an event that led to it more broadly being raised. The curved corners and unusual morphology of the structure allows cross-regional comparison, and compared well with Late Preclassic structures in Petén, but also examples Mendez Cab had seen in Late Preclassic structures from Yucatán.

Burial 3 Excavations and D6-3

(RB-8A-3) Unit 3 was the first unit to be excavated, 10 meters to the west of unit 8A-2. It measured 1 x 1 meter and was placed specifically to locate whether the D6-5 platform wall continued.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 13 cm below the level of the datum (SE). Cultural material emerged, including ceramic, obsidian, chert, jute shell and animal bone. A few rocks are also present near the surface. There is no evidence at this shallow depth of the D6-5 platform, but other structural formations may be emerging.

Lot 2 consisted of a very dark brown and small stone fill layer (10 YR 2/2) which terminated 36 cm below the level of the datum. Lot 2 contained large quantities of ceramic, obsidian, chert, animal bone and jute shell. It terminates at a soil color change.

Lot 3 consisted of a brown layer (10 YR 4/3) under the humus layers. It contained several teeth and skull fragments. Cultural materials included ceramics, lithics, obsidian, animal bone, jute shell, and a stingray spine. It terminates 53 cm below the level of the datum, at a grey natural layer of caliza. At this point, it is confirmed that the platform wall from D6-5 does not extend further west and also hold structure D6-3, allowing excavations to continue with unit 4 in anticipation of finding the D6-5 platform corner.

Lot 4 was a level of natural pale brown soil (10 YR 6/3), with very little in the way of cultural materials. It was deep, and terminated 115 cm below the level of datum at a hard bedrock layer. It contained a few ceramic sherds, and jute shell.

Reflection on the stringray spine and human bone fragments found in the excavation led us to decide to continue excavations surrounding unit 3. For this reason, sub-operation 8A is both the D6-5 platform investigation, and a series of 3 additional units (9, 10, and 13) which were designed to explore possible burial crypt and structure, and any interments in the area.

(RB-8A-9) Unit 9 was the second unit to be excavated, and was opened directly to the west of unit 8A-3. It measured 1 x 1 meter and was oriented to match the site's structures, 30° east-of-north. It was placed to determine whether the possible interment in unit 8A-3 continued.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 13 cm below the level of the datum (SO of Unit 8A-3). A few stones that penetrate into the surface are now believed to be crypt boundary stones and are left intact. Many small human bone fragments are found, and of ceramic, obsidian, animal bone, jute shell and a piece of hematite emerge.

Lot 2 consisted of a very dark brown and small stone fill layer (10 YR 2/2) and terminated 43 cm below the level of the datum. Lot 2 contained ceramic, chert and animal bone. It terminates at a soil color change. After excavation of lot 2, all excavations stop to allow further units to be excavated down to the same level. The crypt stones are confirmed as marking the boundaries of a burial. To the north of them, excavations cease, as this space is not enclosed by them. The south of the stones is bounded on all sides by the crypt stones, and excavation only in this portion commences.

Lot 3 is the final excavation south of the crypt stones, above the burial which is designated burial 3. The soil is brown (10 YR 4/3) and excavations terminate 93 cm below the level of the datum. Cultural materials included ceramics, lithics, obsidian and turtle shell. Excavations below this level, despite being within unit 9, are treated as a single lot; RB-8A-10-4. This is for aid in data management, and because individual artifacts and bones are being drawn by hand, eliminating the need for unit based spatial control at this level.

(RB-8A-10) Unit 10 was the third unit to be excavated, and was opened directly south of units 8A-3 and 8A-9. It measured 2 (E-W) x 1.5 (N-S) meters and was oriented to match the site's structures, 30° east-of-north. It was larger to ensure that all burial materials would be within it, and to allow some basic exploration of structure D6-3, the building to which the burial crypt lay directly north. As it articulated with the structure, it sloped dramatically, with the southern half of the unit starting much higher than the northern portion.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 45 cm below the level of the datum (SE) at center, but due to the incline, the termination point ranged from 13 (SE) to 60 cm (NE), despite the few cm that were actually excavated. A few stones that penetrate into the surface are now believed to be crypt boundary stones and are left intact. Many small human bone fragments are found, as well as ceramic, obsidian, animal bone, jute shell, a sculpted piece of stucco and part of an incense burner.

Lot 2 consisted of a very dark brown and small stone fill layer (10 YR 2/2) and terminated 66 cm below the level of the datum. Lot 2 contained ceramic, chert, shell and animal bone, as well as more human bone fragments. It terminated at a soil color change. Several large flat stones that were found may have been capstones, but were not recognized as such until they were already removed. After excavation of lot 2, all excavations stop to allow unit 11 to be excavated down to the same level.

Lot 3 is targeted to excavate only north of the crypt stones, above the burial which is designated burial 3. For this reason, it's dimensions become much smaller; 159 cm E-W by 26 cm N-S. The soil is brown (10 YR 4/3) and excavations terminate 85 cm below the level of the datum, directly above burial 3. Cultural materials included ceramics, lithics, obsidian and jute shell. Excavations below this level, despite being within several units, are treated as a single lot; RB-8A-10-4. This is for aid in data management, and because individual artifacts and bones are being drawn by hand, eliminating the need for unit based spatial control at this level.

Lot 4 is the excavation of burial 3. In addition to being within unit 10, it contains portions which are within units 9 and 11. The soil matrix was a fine brown (10 YR 4/3) colored fill. It was bounded on all sides by a stone crypt, with overall dimensions of 104 cm by 44 cm, with a crypt depth of 21 cm. The body was flexed on its back, and in good condition. A single ceramic vessel was found placed over the shoulder.   The excavation terminated 107 cm below the unit 10 datum. In addition to the burial itself, ceramic sherds, chert, obsidian and shell were found at the burial level.

(RB-8A-13) Unit 13 was the fourth unit to be excavated, and was opened directly west of units 8A-3 and 8A-9, sharing the balk wall with the north side of them. It measured 2 x 2 meters and was oriented to match the site's structures, 30° east-of-north. It was larger to ensure that all burial materials would be within it, and to allow some basic exploration of structure D6-3, the building to which the burial crypt lay directly north.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 21 cm below the level of the datum (SE). A few stones that penetrate into the surface are now believed to be crypt boundary stones and are left intact, and a cap stone is found on top of them. Many small human bone fragments are found, as well as ceramic, obsidian, jute shell, and hematite.

Lot 2 consisted of a very dark brown and small stone fill layer (10 YR 2/2) and terminated 25 cm below the level of the datum. It was excavated very shallowly, to explore possible human interments. It contained ceramic, chert, shell, as well as more human bone fragments. It was stopped when it reached the same level as the likely crypt. After excavation of lot 2, all excavations stop to allow every unit to be excavated down to the same level.

Lot 3 is targeted to excavate only west of the crypt stones, above the burial which is designated burial 3. For this reason, it's dimensions become much smaller; 24 cm E-W by 32 cm N-S. The soil is brown (10 YR 4/3) and excavations terminate 85 cm below the level of the datum, directly above burial 3. Cultural materials were very few, and included ceramics. Excavations below this level, despite being within several units, are treated as a single lot; RB-8A-10-4. This is for aid in data management, and because individual artifacts and bones are being drawn by hand, eliminating the need for unit based spatial control at this level.

This set of units yielded much new burial and ritual practice data. In addition to burial 3 itself, the distributed human bone at higher levels is unusual. It is unclear whether individuals were spread over the area in a destruction event, due to an unknown type of burial, or due to the destruction of intact graves by roots, gophers, and other biological means. Exploring this question will drive future research at Rancho Búfalo.

Operation 9 - Excavations Surrounding Structure D5-1 (Figures A.46 - A.48)

Sub-operation A – Excavations South of D5-1

(RB-9A-1) Unit 1 measured 1 x 1 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located directly south of the masonry pyramidal structure in the Northwest quadrant of the ceremonial core, E6-4. It was designed to determine the occupation history of the structure as well as the associated plaza.

Lot 1 was a layer of black humus (10 YR 2/1) which terminated 6 cm below the level of the datum (Southwest Corner). It contained many roots. A small amount of cultural material emerged, included highly eroded ceramic and jute shell.

Lot 2 consisted of a very thin brown soil layer under the humus layer (10 YR 2/2) and terminated 8 cm below the level of the datum. It also had a large quantity of roots. This lot contained ceramics, chert, quartz animal bone and shell.

Lot 3 consisted of a brown dark brown soil (7.5 YR 3/2) layer with very small stones, possibly structural collapse. This lot terminated 16 cm below the level of the datum. There were cultural materials, including ceramic, chert, and obsidian as well as jute shell.

Lot 4 was a dark brown soil (7.5 YR 3/2) layer, with some apparent plaster in situ in the northeast corner. It may represent a destroyed stucco plaza floor. It terminated 21 cm below the level of the datum. In addition to stucco, there were ceramic sherds, chert, obsidian, burnt animal bones and shells.

Lot 5 was a dark brown soil (7.5 YR 3/2) layer with some medium stones in situ, possibly collapse that terminated 41 cm below the level of the datum. It contained ceramic, chert and shell.

Lot 6 was similar to lot 5 in composition, but had a slight change in soil tone to another shade of dark brown (7.5 YR 3/3). It also contained some medium stones and terminated 57 cm below the level of the datum. Lot 6 contained ceramic, obsidian, shell, bone, quartz as well as some stucco.

Lot 7 consisted of a hard dark reddish gray layer (2.5 YR 4/1) of fill. It was a matrix of either hard soil or friable rock. It terminated 77 cm under the level of the datum. The amount of cultural materials decreased dramatically in Lot 7, but there was still a small quantity of ceramic as well as jute shell.

Lot 8 was a soft reddish brown soil layer (2.5 YR 5/3), also with a low quantity of cultural material. It contained only ceramic and shell. It terminated 80 cm below the level of the datum.

Lot 9 was light brown bedrock (7.5 YR 6/3). It contained no cultural material and terminated 91 cm below the level of the datum. Overall, RB-9A-1t was very well stratified, with ceramics that change notably through the layers. It indicates structure E6-4 may also be one of the older ones on the site. This makes Operation 9A and the associated area around E6-4 a prime target for further excavation to produce a well stratified occupation sequence.

Sub-operation B – Excavations North of D5-1

This sub-operation was part of a series of excavation designed to study the area north of the site pyramid D5-1, articulating with Rancho Búfalo's northern ceremonial precinct. Units 1 and 2 were a pair of articulated 2 x 2 meter units oriented 30° east-of-north. They produced a 4 meter wide unit directly north of the centerline of the D5-1 pyramid, in hopes of finding an cache axis mirroring that of La Venta. Unit 3 was articulated with D5-2 in an effort to uncover the edge of the structure, and the morphology of the platform edge.

(RB-9B-1) Unit 1 measured 2 x 2 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located directly north of the site pyramid, D5-1, along its centerline, directly to the west of unit 1.

Lot 1 was a level of very dark brown humus (10 YR 2/2) which terminated 53 cm below the level of the datum (Southeast Corner). A small amount of cultural material emerged, included some eroded ceramic, obsidian, chert and jute shell.

Lot 2 consisted of a layer of collapse with a matrix of pale brown (10 YR 6/3) soil. It terminated 72 cm below the level of the datum. This lot also contained ceramics, chert, obsidian, animal bone and obsidian.

Lot 3 consisted of a very light brown soil matrix with no stones (10 YR 7/3). It terminated 123 cm below the level of the datum. This lot only contained shell.

(RB-9B-2) Unit 2 measured 2 x 2 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located directly north of the site pyramid, D5-1, along its centerline, directly to the east of unit 1.

Lot 1 was a level of very dark brown humus (10 YR 2/2) which terminated 39 cm below the level of the datum (Southeast Corner). Cultural material that emerged included ceramic, obsidian, chert, animal bone and jute shell.

Lot 2 consisted of a layer of collapse with a matrix of pale brown (10 YR 6/3) soil. It terminated 72 cm below the level of the datum. This lot contained ceramics,chert tools, animal bone, and obsidian. It ended at a possible plaster floor in a poor state of conservation.

Lot 3 consisted of a layer of excavations on the portion of the unit that did not have an intact plaster floor, measuring 1 x 2 meters. It consisted of a layer of collapse with brown (10 YR 6/3) soil. It terminated 80 cm below the level of the datum. This lot contained ceramics, shell, chert and animal bone.

Lot 4 was an excavation of the plaster floor layer (10 YR 7/3). This lot only contained shell and a small amount of ceramics.

(RB-9B-3) Unit 2 measured 2 x 2 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located to the east of Structure D5-2.

Lot 1 was a level of collapse and very dark brown humus (10 YR 2/2) which terminated 59 cm below the level of the datum (Southeast Corner). Cultural material that emerged included ceramic, obsidian, chert, animal bone and jute shell.

In the excavations from sub-operation 9B, we did not accomplish our objective of finding the centerline north of D5-1. While significant materials were recovered, no primary depositional caches were found. For unit 9B-3, we could not do a deeper level of excavations, as the collapse from D5-2 proved to be too intact to justify its destruction. It looked like in may have been a staircase previously, based on its form.

Operation 10 - Excavations in the Plaza Delimited by Structures D6-8 and E6-4 (Figure A.49)

Sub-operation A – Excavations in Plaza

(RB-10A-1) Unit 1 measured 1 x 1 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located directly between the masonry structure on the Eastern limit of the ceremonial core, E6-4 and the D6 structural complex, in the center of a plaza. It was designed to determine the uses of the plaza as well as the chronology of occupation.

Lot 1 was a level of black humus (7/5 YR 2.5/1) which terminated 9 cm below the level of the datum (Northwest Corner). A small amount of cultural material emerged, included some eroded ceramic, obsidian and jute shell with no clear evidence of working.

Lot 2 consisted of a layer under the humus layer, with dark brown (10 YR 3/3) soil. It terminated 38 cm below the level of the datum. This lot also contained ceramics, chert, obsidian animal bone and shell, but in lower quantities than Lot 1.

Lot 3 consisted of a brown friable soil/rock matrix with no stones at all (7.5 YR 5/4). This lot terminated 62 cm below the level of the datum. While there were cultural materials, including ceramic, chert, and obsidian emerged, as well as some jute shell and bone, the quantities were very low. The amount of jute shell increased dramatically, but it is unclear whether this was anthropogenic or indicate a primarily natural layer.

Lot 4 was a level of reddish yellow layer (7.5 yr 7/6) of friable stone, which was likely a natural level. It terminated 95 cm below the level of the datum. There were few ceramic that it may have fallen from higher excavation levels. There were still a large number of jute shell, possibly not anthropogenic deposition.

Operation 11 - Excavations Surrounding Structure E6-4 (Figures A.50 - A.54)

Sub-operation A – Excavations West of E6-4

This sub-operation took place in two years, 2012 and 2013. In summer 2012 a single test unit (1) was excavated to investigate the structure chronology. Between the 2012 and 2013 field seasons, a major looting event took place which led to substantial damage to the mound. 2013's excavations in operation 11A were designed to collect as much information as possible about the structure, and recover data based on the damage before it was lost to weather and erosion (2, 3, 4, 5).

(RB-11A-1) Unit 1 measured 1 x 1 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located in the center off of the western side of the masonry structure on the eastern limit of the ceremonial core, E6-4. It was designed to determine the occupation chronology of the structure. On the eastern bulk of the unit there was a possible alignment of stones, which was left intact through the excavation, in case it represented intact architecture and not collapse. The unit was inclined substantially from east to west, as it was staked on the collapse of the masonry structure.

Lot 1 was a level of very dark brown humus (10 YR 2/2) which contained a substantial portion of large stone collapse. It terminated 20 cm below the level of the datum (NE Corner) on the Eastern side and terminated 50 cm below the level of the datum on the Western side. The large stones were left intact to ensure it was collapse and not intact architecture. Some small amount of very eroded ceramic emerged, but few other cultural materials.

Lot 2 consisted of a stone collapse layer under the humus layer, with dusky red soil (2.5 YR 3/2) and terminated 67 cm below the level of the datum. This lot also contained highly eroded ceramics, as well as some animal bones, shell, obsidian and chert flakes. After excavating this lot, it became clear that the large stones on the Eastern side of the unit were not an intact wall or stair, but only collapse. They were still left in situ, to allow the possibility of their documentation and reconstruction during more extensive future excavations.

Lot 3 consisted of a dark reddish brown soil layer with no stones at all (5 YR 3/2). This lot terminated 86 cm below the level of the datum. It may have been the first excavated layer to underlie the structural collapse, and thus represent a humus layer from the time of the site's occupation. Large amounts of ceramic, chert, and obsidian emerged, as well as some jute shell and bone.

Lot 4 consisted of a dark reddish brown (5 YR 3/2) soil layer with some medium stones, and terminated 102 cm below the level of the datum. As with lot 3 there was ceramic, chert, as well as some jute shell and animal bone. This lot terminated in a sterile soil level.

Lot 5 was a reddish brown soil layer (2.5 YR 5/3) that was devoid of cultural materials. It was only excavated a small amount, as the in-situ stones above could not reinforced in the confines of the 1 x 1, and the level did not yield any cultural materials. This layer may have been an anthropogenic, basket screened soil layer. It terminated 110 cm below the level of the datum.

(RB-11A-2) Unit 2 was the cleaning of the looted profile in structure E6-4 which was oriented 25° east-of-north to follow the direction of the destruction. It was a single lot. The excavations yielded a substantial amount of sherds, but with limited chronological control, as the looting damage had substantially mixed lots. The excavations did reveal several intact floors and occupational phases, where were then used to produce profiles. The threshold of a perpendicular stone wall, oriented E-W, was found. The dimensions of the looting were substantial, over 5 meters long (N-S) by 3 meters tall. Many different soils were present, as described within the profile drawing. Cultural material emerged, including ceramic, obsidian, chert, jute shell and animal bone.

(RB-11A-3) Unit 3 was the cleaning of the looted profile in structure E6-4 which was oriented 100° east-of-north to follow the direction of the destruction. It was a single lot. It articulated with the southern corner of unit 2, and between both units, an approximate right angle was revealed within the profile. The excavations yielded a substantial amount of sherds, but with limited chronological control, as the looting damage had substantially mixed lots.   The excavations did reveal several intact floors and occupational phases, where were then used to produce profiles. The dimensions of the looting were substantial, over 2.5 meters long (N-S) by 1.5 meters tall at the highest point. Many different soils were present, as described within the profile drawing. Cultural material emerged, including ceramic, obsidian, chert, jute shell and animal bone.

(RB-11A-4) Unit 4 was a test pit excavated directly centered in front of unit 2, to the north of the perpendicular stone wall. It was designed to explore whether the platform was a stepped structure, or whether it was bounded straight on its edges. It was .5 by .5 meters, and oriented to match the site's structures, 30° east-of-north.

Lot 1 was a level of brown fill soil (10 YR 5/3) which terminated 10 cm below the level of the datum (SE). Few cultural material emerged, but there were several ceramic sherds.

Lot 2 consisted of a grayish brown soil fill layer, again, with few artifacts (10 YR 5/2) which terminated 42 cm below the level of the datum. It contained no ceramics, but several jute shells.   It terminated at a soil color change.

Lot 3 consisted of a light brownish gray soil fill layer, again, with few artifacts (10 YR 6/2) which terminated 72 cm below the level of the datum. It contained much more abundant numbers of artifacts, and a more typical fill matrix, with ceramic, jute shell, obsidian, and animal bone. It terminated at a layer of a plaster floor, indicating that the structure may indeed have been somewhat stepped in the past.

Lot 4 consisted a brown (10 YR 4/3) soil matrix that terminated 83 cm below the level of the datum. It contained ceramic and jute shell. It also contained some hard building material and stone, and was much harder to excavate than the higher levels. It terminated at a large stone that was larger than the unit width, and forced the termination of excavations. The excavations were successful in determining more details about the form of the platform enclosed within structure E6-4.

(RB-11A-5) Unit 5 was a test pit excavated directly centered in front of unit 2, to the south of the perpendicular stone wall. It was designed to explore for older platform phases within the structure, at to complement excavations on the outside of the stone wall by unit 4. It was 1.5 by .2 meters, and oriented to match the site's structures, 30° east-of-north. The eastern balk, however, was oriented with the looking damage at 25° east-of-north.

Lot 1 was a level of brown fill soil (10 YR 5/3) which terminated 47 cm below the level of the datum (NE). Many cultural material emerged, including ceramic, chert, obsidian, jute shell and animal bone. It terminated at the level of a plaster floor.

Lot 2 consisted of a very dark grayish brown (10 YR 3/2) soil fill layer directly under the level of the plaster floor which terminated 82 cm below the level of the datum. It was very rich in artifacts, and contained ceramic, chert, jute shell, worked shell, obsidian, a bark beater, and a figurine.

Lot 3 consisted of dark brown soil fill layer (10 YR 3/3) which terminated 98 cm below the level of the datum. It contained ceramic, jute shell, chert, obsidian, and animal bone. It terminated at a layer of a plaster floor, indicating that the structure may indeed have been somewhat stepped in the past.

Lot 4 consisted a brown (10 YR 4/3) soil matrix. It terminated on the west side of the unit in a layer of bedrock. The east side of the unit (84 cm / 150 cm) transformed 30 cm above bedrock into an unusual sandy layer. The unit was divided, and continuation of the sandy level was assigned lot 5. It contained ceramic, jute shell, obsidian, worked shell, and a mano de metate.

Lot 5 consisted was on the eastern side of the unit, still 1.5 meters wide, but extending only 84 centimeters from the eastern balk. The soil was a yellowish brown sandy (10 YR 5/6) level. It was absolutely filled with clam shells, as opposed to the freshwater jute shells that typically characterize the soil layers. It terminated 119 cm below the level of the datum. In addition to the shell, it contained ceramic, obsidian, lithics, and animal bone.

Lot 6 was a continuation of the 84 cm by 1.5 m portion of the unit. It consisted of a dark grayish brown (10 YR 4/2) soil matrix, and terminated 131 cm below the level of the datum. The lot contained ceramic, shell, and animal bone.

Lot 7 was a continuation of the 84 cm by 1.5 m portion of the unit. It consisted of a brown (10 YR 4/3) soil matrix, and terminated 140 cm below the level of the datum. It appears that lots 5 and 6 were cuts into this consistent matrix, one that was seen in lot 4. It also terminated over a very level cut of bedrock, 140 cm below the level of the datum. Despite this, only artifacts classes emerged; low quantities of shell and ceramic. The excavations were successful in determining more details about architectural phases enclosed within structure E6-4, discovering at least one additional earlier construction phase, based on the in-situ plaster floor.

Excavations in Operation 11 were designed to recover as much information as possible from the damaged structure E6-4, before this looting damage led to a greater destruction. In this, the excavations were very successful. Many building phases were identified, and the architectural profiles produced provide much information on the site's occupation chronology and the nature of occupation. The large number of phases in this ritual structure, and persistence in the use of similar earthen architecture over such a long period, is an important datapoint in Preclassic Usumacinta archaeology.

Sub-operation B – Excavations East of E6-4

(RB-11B-1) Unit 1 measured 1 x 1 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located in the center off the eastern side the masonry structure on the eastern limit of the ceremonial core, E6-4. It was designed to determine the use of the plaza as well as the chronology while determining the occupation chronology of the structure.

Lot 1 was a level of black humus (10 YR 2/2) which terminated 36 cm below the level of the datum (Northwest Corner). It had a small quantity of roots, and a medium stone, possibly of architecture, in the Southwest portion of the unit. A small amount of cultural material emerged, included some highly eroded ceramic, chert, animal bone and shell.

Lot 2 consisted of a collapse layer under the humus, with very dark brown (10 YR 4/2) soil and terminated 57 cm below the level of the datum. It contained a large number of small stones, as well as the possible remains of a stucco floor. This lot contained ceramics, chert, obsidian, animal bone and shell. An intrusive set of fill, which was believed at the time to represent a possible intact portion of the masonry architecture, emerged on the western side of the unit. These stones were left intact.

Lot 3 consisted of a dark brown soil/rock matrix with small stones (7.5 YR 5/4). This lot terminated 62 cm below the level of the datum. The stones in the western extent of the unit appear to possibly have been collapse, not intact architecture. They were still left intact throughout the excavation, as until further excavations are possible to ascertain their position of origin. Some grey soil streaks became clear in the profile, and the number of artifacts decreased substantially. There was only ceramic and shell, in low quantities.

Lot 4 was a level of soft brown soil (10 YR 4/4) with some lighter and darker soil streaks within the profile. It terminated 96 cm below the level of the datum. While drawing an additional soil change underlying Lot 4 was noted. It has been noted and labeled Lot 4A in the drawings. There were nearly no cultural artifacts in these lots, only a handful of sherds and shell. From this point on, it was realized that this was a likely earthen fill layer, not unlikely those recently found in Ceibal, Guatemala and traditionally associated with the Olmec in sites like La Venta, Tabasco. The low quantities of artifacts may be a product of basket sifting of the fill, and the diversity in colors may indicate soil being brought in from diverse locations.

Lot 5 was a level of very soft dark grayish brown soil (10 YR 4/2), also without stones and nearly devoid of cultural materials. It terminated 138 cm below the level of the datum. In the northern profile, an up-down lighter colored section of soil appeared, and continued down into lots 6 and 7. Very little cultural material was recovered again, only some ceramic sherds, one obsidian flake, and a shell, Critically, two of these sherds were found in situ, confirming that these low quantities of material were not simply falling from the bulk, and that the excavations remained in cultural layers, not an unusual natural fill layer.

Lot 6 was a dark greyish brown cap (10 YR 4/2) of soil that terminated 157 cm below the level of the datum. It contained many inclusion of white soil in its matrix, which induced the lot change for 5, which has the same soil type. There were no cultural materials.

Lot 7 was brown colored (10 YR 5/3) layer of the same type of packed soil. It terminated 183 cm below the level of the datum. There were very few cultural materials, including ceramic and shell. Some of the shell was of a different class than jute, and may represent an imported shell type.

Lot 8 was very different than the preceding sterile soil in Lots 4 through 8. The soil matrix was much coarser, and light yellowish brown (10 YR 6/4). This type of course grained soil was present in all succeeding levels, though it is not clear whether it represents additional anthropogenic fill layers of imported river or stream soil mixed with cultural materials, or an occupation layer that predated the earthen platform from a time of different site hydrology. The lot terminated 198 cm below the level of the datum. It contained many small, smooth stones, likely river cobbles. There was also a void in the soil level, which might have lead to some mixing between the lots above and below lot 8. In addition to the cobble fill, a medium stone appeared in the northwest corner of the unit. The amount of cultural material also increased dramatically as compared to the higher lots, including ceramic, obsidian, and shell.

Lot 9 consisted of a very dark brown layer (10 YR 2/2) of the same type of course soil fill with river cobbles in the matrix. It terminated 208 cm below the level of the datum. The amount of cultural materials increased even more dramatically, as well as the diversity. There was ceramic, chert, obsidian, bones and shell, as well as 2 high quality carbon samples. The number of large stones in the matrix increased dramatically, complicating the excavation a great deal, as removing them from the bulk could compromise the stability of the unit. As a 1 x 1, the unit was too small for reinforcement.

Lot 10 was another coarse brown (10 YR 5/3) soil layer with a dramatic increase in quantities of shell. It terminated 232 cm below the level of the surface. It too contained the river cobbles and larger sized rocks. Some of these were left in the bulk, tapering the excavation space to ensure the stability of the unit. In addition to ceramic, chert, obsidian, bones and shell, as well as another high quality carbon sample, there was some amount of burnt bone.

Lot 11 was a coarse dark brownish yellow (10 YR 4/4) soil layer that terminated 238 cm below the level of the datum. The number of medium stones decreased somewhat in this layer. There was ceramic, chert, obsidian, bones and shell, as well as some possibly ocean-derived imported shells. 1 high quality carbon sample was also collected. A unusual and substantial sherd with an incised chevron-like decoration was recovered from this level, along with a carbon sample that articulated with it directly.

Lot 12 was a brown course grained soil layer with many large rocks throughout the matrix. It terminated 258 cm below the level of the datum. There were also a substantial quantity of carbon, leading to the collection of several well-contextualized pieces. The number of cultural artifacts remained very high. There was ceramic, chert, obsidian, bones and shell, as well as a good conditioned barkbeater, and an unusual grinding stone.

Unfortunately, due to the size of the unit, the depth of excavation, and the increasing number of stones, it was decided that excavation should terminate at lot 12. Instead of going to sterile soil, as in the other 2012 excavations here, RB-11B-1 was not excavated to the maximum possible extent. Next year, a 2 x 2 will be dug in this area to allow the careful use of supports and reinforcements to ensure collapse does not occur, and deeper excavations. This will allow a better understanding of the intricacies of the earthen platform, as well a strong chronological sequence, perhaps to the earliest phases of the site. This unit was critical, at it has demonstrated that a previously unknown type of construction was being used in the Usuamactinta region. It is an important development in the understanding of Rancho Búfalo, and further excavations in this part of the site will be crucial to forging a stratified occupation sequence.

Operation 12 - Excavations at Site Core Limits Surrounding D6 Complex (Figures A.55 - A.57)

Sub-operation A – Excavations South of D6 at Site Limit

(RB-12A-1) Unit 1 measured 1 x 1 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located in the center of the plaza south of the ceremonial core of the site and the D6 complex. It was placed to determine whether occupation continued south of the visible masonry structures.

Lot 1 was a level of black humus (7.5 YR 2.5/1) and terminated 24 cm below the level of the datum (the NE corner of the unit). This lot contained moderate amounts of cultural materials, including ceramic, chert, obsidian and quartz.

Lot 2 was a level of dark yellowish brown semi solified soil (10 YR 4/4) which was highly friable, and 49 cm below the level of the datum. This lot contained no cultural materials.

Lot 3 was a registro, a 50 cm by 50 cm continuation in the northeast corner of the unit to see if any cultural materials would emerge. It was the same dark yellowish brown semi-solid soil (10 YR 4/4) matrix. It terminated at a level of bedrock, and also yielded no cultural materials. While it is possible that post-occupation processes have removed soil from this area, it seems that Rancho Búfalo's occupation did not extend south of the site. Further excavations to the south of the ceremonial core will be performed next year to confirm the occupation extent during the next field season.

Sub-operation B – Excavations Southwest of D6 at Site Limit

(RB-12B-1) Unit 1 measured 1 x 1 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located in the center of a plaza to the West of the ceremonial core of the site and the D6 complex, but before the Western arroyo. It was placed to determine whether occupation continued west of the visible structures, though after beginning excavations, additional masonry platforms were found further to the west on the opposite side of the arroyo.

Lot 1 was a level of black humus (5 YR 2.5/1) and terminated 27 cm below the level of the datum (the NE corner of the unit). This lot contained large amounts of cultural materials ceramic, chert, obsidian, jute shell, and animal bone. Neither the bones nor the shell showed evidence of working. There was a substantial stone in the bulk of the unit, which occupied space in both lot 1 and lot 2.

Lot 2 was a level of reddish black soil (10 YR 2.5/1) and terminated 64 cm below the level of the datum. This lot also contained abundant cultural materials, including ceramic, chert, obsidian, jute shell, quartz and animal bone. There was a worked bone, a plastron from a turtle or tortoise that had been drilled in the center. There was also some imported shell. The density of materials indicates that there was active occupation in this portion of the site, between the structures and arroyo. It is not highly stratified, however, and excavations in this area cannot be used to generate a well-defined occupation sequence.

Sub-operation C – Excavations Southeast of D6 at Site Limit

(RB-12C-1) Unit 1 measured 1 x 1 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located directly west of an alignment of the stone which may have been used to delimit the ancient flow of a nearby arroyo on the western limit of the ceremonial core. It is north of a dam structure that appears to have bridged this arroyo, first located this season.

Lot 1 was a level of black humus (5 YR 2.5/1) and terminated 36 cm below the level of the datum (the NE corner of the unit). This lot contained ceramic, chert, obsidian, jute shell, a substantial quantity of animal bone and fragments of a human tibia. Excavating the humus layer revealed an additional stone which matched the alignment bounding the eastern portion of the unit, confirming that this represents a low wall or water-guiding stone alignment.

Lot 2 consisted of a small stone fill layer in a matrix of dusky red soil (2.5 YR 3/2) and terminated 42 cm below the level of the datum. This lot contained highly eroded ceramic, chert, obsidian, jute shell and a substantial quantity of animal bones. No further courses of stone were found, indicating that the alignment of stones was shallow.

Lot 3 consisted of a yellow brown hard soil/rock matrix (10 YR 5/8) with some pieces of sedimentary limestone and terminated 65 cm below the level of the datum. It may represent a semi-natural layer of sedimentation. It was difficult to excavate evenly, and at times fractures propagated through the matrix in unexpected directions and disrupted the unit walls. Small amounts of ceramic, chert, and obsidian emerged, as well as some jute shell with no clear evidence of working.

Lot 4 consisted of a substantial brownish yellow (10 YR 6/6) and white hard soil/rock matrix with some portion of sedimentary limestone and terminated 156 cm below the level of the datum. It may represent a semi-natural layer of sedimentation. As with the layer above, at times fractures would propagate through the matrix in unexpected directions. Very small amounts of ceramic, chert, and obsidian emerged, as well as some jute shell with no clear evidence of working. These may have fallen from higher levels during the fracturing process. This lot did not terminate in a level change, but in the water table. Excavating to lower levels will not be possible without a water pump, however, the continuing presence of cultural materials indicates that this may be a worthwhile endeavor to explore ancient use of the arroyo. The material rich upper layers are fascinating, and may imply an active trading use for the arroyo, or its articulation with a broader market context.

Operation 13 – Excavations in the Plaza Delimited by Structures D5-1, E6-1 and D6-8 (Figures A.58 - A.60)

Sub-operation A – Excavations in Plaza

This sub-operation was to investigate the plaza to the east of structure D5-1. It was excavated in two years; the first Unit (1) in the summer 2012 filed season 1. The excavations in RB-13A-1 recovered bedrock formations very close to the surface level of the plaza. Several stone formations emerged that appeared to have meaningful orientation, and were perhaps anthropogenic cuts in the bedrock. As a 1 x 1 meter excavation, it was not possible to fully explore the formations. RB 13-A-2 was opened directly to the south of the 1x1 excavated in 2012, in an effort to explore whether these formations indicated anthropogenic steps, or were simply natural formations close to the plaza level.

(RB-13A-1) Unit 1 measured 1 x 1 m, and was oriented to match the line of the site's structures, 30° east-of-north. The unit was located approximately in the center of the plaza delimited to the north by structure D5-5, to the east by structure D5-1, to the west by structure E6-1 and to the south by the D6 complex.

Lot 1 was a level of black humus (10 YR 2/1) and terminated 13 cm below the level of the datum (the SW corner of the unit). This lot contained highly eroded ceramic, chert, obsidian and jute shell. In the south and west of the unit, it terminated in a layer of stone, perhaps a corner of roughly hewn steps, which continued beyond the extent of the unit. These steps were not removed, and excavation continued with these sets of stones bound the next lot.

Lot 2 consisted of a small stone fill layer in a matrix of very dark brown soil (10 YR 4/2), in front of the "step". At its deepest point, in the north east corner, the unit terminated 50 cm below the datum. This lot contained highly eroded ceramic, chert, obsidian, jute shell and animal bones. Excavating out this layer of fill revealed an additional two levels of possible roughly hewn steps. Further excavations were designed to confirm whether these 'steps' are an actual architectural feature, carved bedrock, or a natural feature. If they were an architectural feature, it was thought possible that they could represent part of a sunken plaza and one of the earliest features in Rancho Búfalo's occupation.

(RB-13A-2) Unit 2 measured 2x 2 meter and oriented to match the site's structures, 30° east-of-north. It was placed specifically to explore whether the possible structure found within RB-13A-1 continued.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 17 cm below the level of the datum (SW). Cultural material emerged, including highely eroded ceramic, obsidian, chert, jute shell and animal bone. It terminates at the level of stones as discovered in 2012.

Lot 2 consisted of a very dark brown and small stone fill layer (10 YR 2/2) which surrounded major rock formations. The stones and bedrock is not oriented in a structural manner It terminated 43 cm below the level of the datum. Lot 2 contained only eroded ceramic and jute shell.

Lot 3 consisted of a light grey stone (10 YR 7/2). It was excavated lightly to explore whether the bedrock continued. Only ceramics and lithics from higher levels were recovered, and no further depth of excavation was achieved, and the unit and sub operation were closed. This excavation was designed to explore the possible architectural feature constructed of bedrock discovered in 2012. The bedrock is naturally uneven and close to the plaza surface, and lack of orientation in a structural manner indicates that this was not a structure, and represents a natural formation.

Operation 14 – Excavations Beyond Site Core to South (Figures A.61 - A.63)

(RB-14A-1) Unit 1 measured 1 x 1 meter and was oriented to match the site's structures, 30° east-of-north. It was placed directly off the of the east side of a new structure found over the arroyo to the west of the ceremonial core. It was designed to explore the chronology of the unit and depth of settlement.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 26 cm below the level of the datum (SW). Cultural material emerged, including highly eroded ceramic, obsidian, chert and jute shell. There is a large stone also, perhaps collapse from the mound.

Lot 2 consisted of a black humus layer (10 YR 2/1) which surrounded the rock formation. It terminated 39 cm below the level of the datum. It contained ceramic, obsidian, chert, animal bone, hematite and jute shell. It terminates at a level of very hard limestone, but not quite bedrock

Lot 3 consisted of the hard grey stone overlying bedrock (10 YR 7/2). It was excavated to a depth of 53 cm below datum, but was very hard to work and terminated at bedrock. It demonstrated that a possible stone orientation off of the mound was only collapse. This lot contained ceramics, chert, obsidian and jute shell.

(RB-14B-1) Unit 1 measured 1 x 1 meter and oriented to match the site's structures, 30° east-of-north. It was placed near what looked like a stone wall twenty meters to the south of unit RB-14A-1.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 22 cm below the level of the datum at bedrock (SW). The unusual geology may be explained by the nearby arroyo. Little cultural material emerged, only highly eroded ceramic.

(RB-14C-1) Unit 1 measured 1 x 1 meter and was oriented to match the site's structures, 30° east-of-north. It was placed west of RB-14A-1, as far as possible while still being within the ranch on which we had permission to excavate to see if settlement continued to the west of the ceremonial core.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 22 cm below the level of the datum (NW). Cultural material emerged, including abundant ceramic, chert, obsidian, shell and animal bone. This indicated immediately that, despite the general lack of structures, occupation of Rancho Búfalo continued well past the threshold of the large mounded architecture.

Lot 2 consisted of a very dark gray soil layer (10 YR 3/1) which terminated 45 cm below the level of the datum. Small stones were also within the matrix. It contained ceramic, obsidian, chert, and jute shell.

Lot 3 consisted a brown soil (10 YR 3/3) that terminated at bedrock 79 cm below the level of the datum. This lot contained few cultural materials, including ceramics and and jute shell. The dramatic reduction in material beyond the humus layer may indicate that the use of territory outside of the Preclassic mounded center actually post-dated the primary occupation of the site's architecture, perhaps representing a lower level outlying settlement from the nearby site of Flores Magon.

Operation 15 – Excavations Beyond Site Core to West (Figures A.64 - A.65)

(RB-15A-1) Unit 1 measured 1 x 1 meter and oriented to match the site's structures, 30° east-of-north. It was placed 10 M to the north of the range structure on the northern threshold of the ceremonial core, and was placed to see if settlement continued to the north of the ceremonial core. It was across the northern arroyo, and within viewing range of unit 3B-1.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 6 cm below the level of the datum (NW). Only shell emerged, perhaps not cultural. This appears to not have been occupied, despite the nearby structure.

Lot 2 consisted of a very dark gray soil layer (10 YR 3/1) which terminated 45 cm below the level of the datum. Small stones were also within the matrix. Again, it contained only jute shell, and no cultural materials. It was determined to be a non-cultural occupation area; perhaps the movement of the arroyo or sedimentation obscured any cultural data.

(RB-15A-2) Unit 2 was placed directly 10 meters to the north of D5-3 in what looked like a possible anthropogenic stone outcrop. It yielded cultural material, but quickly came on a solid limestone surface that could not be excavated further. It measured 1 x 1 meter and was oriented to match the site's structures, 30° east-of-north.

Lot 1 was a level of black humus (10 YR 2/1) which terminated 7 cm below the level of the datum (NW). Cultural materials emerged in small quantities, including ceramics, chert, obsidian, jute shell and quartz.

Lot 2 consisted of the same black (10 YR 2/1) soil between a series of limestone. The stone bounded the unit on all sides and preventing further excavation. It which terminated 20 cm below the level of the datum. Small stones were also within the matrix. It contained ceramic and chert. This excavation confirmed occupation north of the close to the ceremonial precinct, but could not provide a full chronology due to the limestone impeding excavation.

Operation 16 – Excavations Beyond Site Core to East (Figure A.66)

(RB-16A-1) Unit 1 was 25 meters to the east of E6-4, directly before the arroyo bounding the site on the east side. It was placed to see if settlement continued to the east of the ceremonial core. It yielded cultural materials in high quantity, but likely in secondary context, as it seemed to be highly sedimented and difficult to excavate run-off from the structure. It measured 1 x 1 meter and was oriented to match the site's structures, 30° east-of-north.

Lot 1 was a level of black humus (10 YR 2/1) with many roots which terminated 12 cm below the level of the datum (SW). Cultural materials included small amounts of ceramics and chert.

Lot 2 consisted of dark brown (10 YR 3/3) soil between a series of limestone. It which terminated 32 cm below the level of the datum. It contained ceramic, chert, obsidian, animal bone, and a mano de metate. Excavation was extremely slow due to the nature of the muddy, fine sediment.

Lot 3 consisted of a dark brown (10 YR 3/3) soil with small stones. It terminated 41 cm below the level of the datum. It contained ceramics, chert, animal bone, a ball, and jute shell.

Lot 4 consisted of a dark brown (10 YR 3/3) soil layer with large stones. It terminated 72 cm below the level of the datum and had a large stone in the center. It contained much fewer cultural materials, only ceramics and jute shell. The lot terminated at bed rock.

Operation 17 – Excavations Beyond Site Core to North (Figure A.67)

(RB-17A-1) Unit 1 was 50 meters to the south of the ballcourt platform, D6-8. It was placed to see if settlement continued to the south of the ceremonial core. It measured 1 x 1 meter and was oriented to match the site's structures, 30° east-of-north.

Lot 1 was a level of black humus (10 YR 2/1) with many roots which terminated 14 cm below the level of the datum (SW). It yielded low quantities of cultural materials, including small amounts of ceramics and obsidian.

Lot 2 consisted of dark brown (10 YR 3/3) soil matrix. It which terminated 42 cm below the level of the datum, and was dense and difficult to excavate. It contained three rounded limestone rocks, likely natural and not anthropogenic. It contained ceramic, chert, obsidian, and quartz.

Lot 3 consisted of a dark brown (10 YR 3/3) soil with many small stones. It terminated 62 cm below the level of the datum at bedrock. It contained only a low quantity of ceramics and jute shell.

Excavations in Operations 14, 15, 16, and 17 did not explore specific architectural or surface visible archaeological features. Instead, they were designed to recover stratified sets of archaeological material from non-mounded occupation contexts. Few ceramics were found in most cases, establishing that the site core itself is a firm limit of occupation, or that shifting arroyos obliterated remains from beyond the main center.

Mapping

During the 2011 field season at Rancho Búfalo, several thousand topographic points were collected with a Total Station to allow the production of a three dimensional construction of the mounded site and an accurate line map. In 2012 and 2013, after excavations were completed, points from excavated test pits and extant architectural features were integrated into the extant Geographic Information System (GIS) for Rancho Búfalo. Over several days at the end of the 2012 and 2013 field seasons, an additional 1200 topographic points were collected to improve the quality of the site map and three dimensional reconstructions.

New points were taken on structure D6-8, to resolve a low collapsed structure or altar that was found on its roof. Mapping continued in the western extent of the site, past the arroyo which was thought to mark the limits of Rancho Búfalo's occupation. This work led to the discovery of several low masonry platforms beyond the arroyo, as well as a possible dam feature which may have simultaneously been used to control these water resources and to allow travel between the eastern and western parts of the site. None of these structures extend higher than a single course of stone at ground level, and cannot be resolved in the GIS's Digital Elevation Model. These low structures may be a series of non-elite residential house mounds which were both symbolically and physically separated from the "ceremonial core" where most of the work at Rancho Búfalo has taken place so far. This new portion of the site is not yet well understood, and comparing material culture between this context and the "core" of the site surrounded by arroyos will be a crucial task in upcoming field seasons.

Local Reconnaissance: Secondary Groups Surrounding Rancho Búfalo

The 2014 field season provided an opportunity to study settlement and occupations in the immediate area (0-2 km) surrounding the well-understood ceremonial center of Rancho Búfalo, Chiapas, Mexico. All of the land surrounding Rancho Búfalo is privately owned, and it has taken time to achieve the necessary level of trust to be allowed to access terrain surrounding the ceremonial core. Even after four field seasons, several ranch owners declined to offer permission for us to enter their terrain.

In 2014, three major reconnaissance projects were undertaken in this local area (Figure A.68). The first was mapping a pair of structural groups directly to the west of Rancho Búfalo by approximately 500 meters, in previous unexplored terrain, named the El Vecino group. The second and third were investigations of hilltop sites surrounding Rancho Búfalo; Rancho Santa Cruz, and The Hearthstones group. In both cases, structures on high hills with incredible viewsheds of Rancho Búfalo were found. To produce our maps, we integrated data from a handheld Magellan 510XT GPS, tape and compass mapping, and LANDSAT satellite imagery. These contribute to our understanding of Pre-Columbian settlement surrounding the ceremonial site center.

Rancho Búfalo's Western Settlement: The El Vecino Group (Figures A.69 - A.76)

While Rancho Búfalo's ceremonial site core has been explored extensively, no household occupations have yet been found. Possible household groups explored in 2013, including those excavated on top of the D6-8 platform (Operation 6F) and in the northern extent of the site center (Operation 1H) both appear to be Classic period residences. Preliminary analysis of ceramics from these contexts points overwhelmingly towards a brief re-occupation during the Late Classic. This is in keeping with the locations of these household groups, as both appear to be in ceremonially charged areas: directly in the game-way of the ballcourt structure, and in the center of the northern ceremonial precinct where tombs, caches, and local rituals likely took place.

Given our extensive exploration of the site and the lack of household groups, the prevailing theory about Rancho Búfalo's Preclassic households is that they primarily existed outside of the ceremonial site core delimited by large masonry architecture and a series of surrounding arroyos. Unfortunately, issues of local landowner permission had precluded our exploring these topics previously. This year, however, after seeing PABC's successful collaboration with Rancho Búfalo's landowners over the past 4 years, in summer 2014, the landowner directly to the West of Rancho Búfalo offered us the opportunity to visit his land, and see a series of architectural features on his terrain. While we were not able to do a systematic survey or perform excavations, the exploration was helpful in starting to understand Rancho Búfalo's regional settlement. We were shown two structural groups located 500 meters to the west of Rancho Búfalo at El Vecino (Figure 2.7). Neither had suffered any looting. Both contained masonry architecture, and were oriented at 30 degrees East-of-north, in keeping with other Usumacinta sites and Rancho Búfalo's structural patterns.

The more complex structural group consisted of two structures (Figure 2.8). The largest was an L-shaped platform which reached nearly 2 meters in height (Figure 2.9). L-shaped platforms are well known residential forms throughout Maya history, and it seems likely that this was an elite-level household. This building articulated directly with an additional square-shaped structure to the west. This second, western platform had a well-defined step edge touching the plaza which was completely intact (Figure 2.10.). In the center was an additional elevated one step platform (Figure 2.11). This composite structure resembles the low altar known from the Cross Group at Palenque, though it is not as substantial (Figure 2.12).

The second structural group consisted of a single very large platform 100 meters to the south of the structure pair (Figure 2.13). This 20 meter wide platform had a staircase on the southern side, and was 2 meters tall through most of its body (Figure 2.14). No intact lines of stone appear, but the scattered and collapsed stones throughout its form indicate that it was also built of masonry architecture. The relative orientation of both group 1 and group 2 to the Rancho Búfalo site center, directly 300 degrees off of Rancho Búfalo, suggests that they were related groups that follow the primary axis of the archaeological site. We suggest these are extra-spatial ceremonial structures, which may have offered sighting lines to Rancho Búfalo and related directly to activities that took place at the site center.

While dating the structures is difficult without excavation processes, the dirt road leading to them and an extensive recently plowed *milpa* to the west of group 1 provided an opportunity to seek materials which could be used to date the platforms (Figure 2.15). The leading indicator for a Preclassic date was the extensive *jute* shell found throughout the area. *Jute* is found in very large quantities at Rancho Búfalo, and is also known from other parts of the Maya area to have been a substantial subsistence item during the Preclassic period. Most critically, however, were the various ceramics that had been plowed to the surface. Many sherds with waxy red slips from the *chicanel* and *mamom* Preclassic Maya ceramic complexes were found on the surface (Figure 2.16). More broadly, there were various stones that had been knocked through plowing, and utilitarian artifacts such as stone tools.

Overall, we take this data to indicate that this area was occupied and used during the same period as Rancho Búfalo's ceremonial core. While the L-shaped platform may have been the elite structure in this residential group, the wide variety of material may indicate "invisible houses" and non-elite structures in which a broader social range of Rancho Búfalo's population may have been living. If true, this would be the first known set of Preclassic households that relate to Rancho Búfalo, and further excavation and investigation may be used to see how non-ceremonial behaviors of the Preclassic Usumacinta River Valley differ from broader Lowland Maya trends.

Rancho Búfalo Hearthstones Group (Figures A.77 - A.87)

Rancho Búfalo was placed strategically to control East-West passes through the Lacandon Mountain Range that bordered the Usumacinta River Valley on either side. Mountains rise up less than a kilometer to the west of Rancho Búfalo, and there are several 50 to 100 meter tall hills independent of the mountain range with substantial views of the River Valley. During the 2014 field season, we were able to clear, climb, and investigate a large number of these hills within 2 kilometers of Rancho Búfalo. Nearly all of the hills were entirely unoccupied, revealing nothing of anthropologic modification or masonry architecture. A single unique hill, the tallest and largest of the entire group, had substantial masonry architecture on top of it (Figure 2.17, 2.18).

The hill itself, besides being the largest in the valley, is also morphologically distinct. It had three separate lobes, with low passes between them. In some ways, I suggest this makes it resemble a triadic group. Compared to the active solsticial alignments taking place at E-Groups and ballgame rituals taking place at ballcourts, the use of triadic groups, beyond a venue for ritual, are not as clear. Triadic groups involve three structures on top of a single platform. Towards the back of the platform, is a single large pyramid, flanked on either side by two smaller structures towards the front of the platform (Estrada-Belli 2011:67; Szymanski 2013:7). They do not share a standard orientation, and vary widely depending on site and context (Szymanski 2013:25). Triadic groups were common throughout the Maya area in the Late Preclassic, but unlike ballcourts and E-Groups, do not have a presence throughout the rest of Mesoamerica. The significance within the Maya area cannot be overstated, and the largest structure ever produced by the Maya, the Danta Complex at El Mirador, was designed as a triadic group (Howell and Copeland 1989). Other critical architectural complexes throughout the Maya Area, including the San Bartolo Las Pinturas Group with famous creation-myth murals, were also designed as Triadic Groups (Saturno 2009:118).

The triadic form of these complexes was evocative of the hearthstones, the founding trio of rocks referenced in the Popol Vuh and modern Maya rituals, as well as in connection with world-beginning events in mythological descriptions from Quirigua, Guatemala and Palenque (Looper 2003:127). They often feature substantial masks, and it has also been suggested their symbolism it relates to the myths of the Principle Bird Deity (Szymanski 2013:130). Due to this hills natural similarity to anthropogenic triadic structures, we are calling the set of structures built on the peaks of this tri-lobed hill "The Hearthstones Group."

At the peak of each lobe of this triadic hill, masonry architecture buildings at the standard Usumacinta region 30 degrees east-of-north orientation were found. The location of these structures on top of hills, and not very accessible to ground level, suggest they may have been built in a time of increasing conflict where the energy required to build and live in these defensive position may have been considered worthwhile. This is further suggested by the presence of a single low wall along one of the peak rises, which would have inhibited site access in the past, and continues to represent an obstacle to ascent in the present day.

Group A, consisted of a patio group, with a similar morphology to many other residential examples found throughout the Maya area (Figure 2.21, 2.22). The entrance to this patio group appeared to be to the North-West, where a narrow gap could be found in the masonry architecture. The primary morphological difference from typical patio groups in the Maya area is the substantial structure integrated into the patio square. This structure was substantially damaged in modern times, and may have been excavated in an effort to seek a tomb or burial goods.

The destruction of this building allowed an opportunity to explore the method of architecture used in its construction and possible connections with other lowland Maya examples (Figure 2.21). A full architectural profile was produced, though no excavation was undertaken (Figure 2.22). The tomb inside appeared to have a substantial (2 meter) cross member capping the burial chamber. Additionally, there is no indication of the use of a false-arch in the construction of this building. This differs from the Rancho Búfalo Burial 1, in which a pair of smaller stones was used at the cap of the burial, and the chamber itself relied on a "false arch" for support.

In other ways, however, the burial does show strong similarities and connections to Rancho Búfalo. The 30 degree orientation of tomb and surrounding structures likely indicate a 30 degree orientation of the body itself. This would match with Burial 1 at Rancho Búfalo. Additionally, the relative position of the tomb and the Hearthstones Group more broadly as compared to Rancho Búfalo raises an interesting possibility. Chronologically, however, the group appears to be primarily a Classic Period occupation. A few scattered sherds were found around the looting damage surrounding the tomb, including some that could be dated by their slips to the Late Classic.

The other two groups at the Hearthstones Complex, groups B and C, involved a single masonry platforms at the highest point on their respective hills (Figure 2.22, 2.23, 2.24, 2.25). One of them, Group B, seemed to also contain active terracing and artificial modification of the underlying hill in order to increase the apparent height of the structure. The other, Group C, was the smallest of the three complexes, and involved no apparent modification of the base hill.

The set of hills is arduous to ascend. The fastest way to climb to Group A, the patio group, is to by entering the north-south "saddle" dividing this larger peak from the two smaller peaks. From the center of this climb, it is then possible to climb the Group A hill directly, a routing that ends in the one break in the patio group which allows entrance into the courtyard without crossing a structure. This routing would have required circumnavigating most of the hill in plain sight of the occupiers, who would have had a viewshed of the entire valley (Figure 2.19). It also would have exposed attackers to projectile weapons, and given defender an advantageous position in melee combat.

Directly perpendicular to this route we discovered an additional anthropogenic feature that further increases the defensive advantage of the Hearthstones Group. A 10 meter long wall of poor quality masonry construction is half way up the second part of the ascent channel (Figure 2.20, 2.21). It is approximately a meter tall at its highest point, is difficult to scale, and may have been the foundation for a rudimentary palisade. The expedient nature of the feature suggests a rushed project similar to the walls constructed at Aguateca, Guatemala immediately before the site was sacked, burned, and abandoned. Instead of a permanent feature, these types of defensive structures represent last-minute fortifications designed as a final line of defense. A victory would be followed by the fortification or removal of such a feature; the continued presence of the wall, as with the Aguateca examples, indicates that the site was abandoned soon after the conflict leading to its construction.

In Mesoamerica, hills and mountains were a component of deep-time religious beliefs related to their sacred nature. Early site founders drew upon and developed the concept of the sacred "flower-mountain" and its tie to world origin and fertility. Mesoamerican pyramids are often understood as anthropogenic examples of this natural phenomenon, used by elite peoples to integrate their communities (Cohodas 1980; Saturno, et al. 2005; Taube 2004a). In the case of Rancho Búfalo, this was the tallest mountain or hill independent of the mountain range in close proximity. Additionally, triple mountains are a common Teotihuacano motif, being painted on plastered tripod vessels.

In the Classic Period, when occupation on the site centers becomes much more intense, the construction of residential architecture on top of this inaccessible hill becomes understandable. In context, we know well the intensity of conflicts and territorial warfare taking place between major centers like Piedras Negras, Yaxchilan, and Palenque. Despite the difficulty in living far from ground-level and portering up water and supplies, it was still considered a worthwhile expense. This trend occurs in other parts of the Usumacinta, and in Mesoamerica more broadly, especially during the Terminal Classic. The presence of an expedient defensive construction further indicates the presence of active warfare and combat during this time period.

While defense may seem to be the most logical reason to build in such an inaccessible location, the construction of individual structures on the peaks of each of these hills is evocative of the Palenque Cross-Group. This complex is not defensive, and is instead a sacred and ceremonially loaded part of Classic Period Palenque. Given the significance of triadic groups in

Maya thought, it is likely that the Hearthstones Group was considered advantageous from both a defensive and ceremonial standpoint.

Rancho Santa Cruz (Figures A.88 - A.92)

Santa Cruz is a series of terraces and structures attached directly to the North-South Lacaondon Mountain Range that defines the western side of the valley in which Rancho Búfalo lies (Figure 2.31, 2.32, 2.33). It is located one kilometer west of Rancho Búfalo on the opposite (south) side of the highway. While approaching from the valley requires an ascent of nearly 200 meters to the peak, it would also be possible to approach from behind along the mountain ridge. We were not able to fully analyze the Rancho Santa Cruz plot, but what we found indicates that it was an important and highly visible complex in the area surrounding Rancho Búfalo).

The viewshed from Rancho Santa Cruz allows people at the site to look down upon all the other complexes and routes described in this chapter and chapter 3 (Figure 2.34). Given the lack of topography in the valley floor, on a clear day Rancho Santa Cruz gives the track movement up to the limits of human eye. Given these restrictions, what may be more important than Santa Cruz occupants ability to see others was their ability to be seen.

Mutual visibility is a major component of Maya authority, and ensuring that your subjects could see you was crucial in maintaining authority. This has been documented by Golden and others in their GIS exploration of viewsheds surrounding Yaxchilan and Piedras Negras, and the use of site visibility and “animated” carved stone monuments to control their subjects. The knowledge that Santa Cruz occupants were able to see the entire valley would have imposed a panoptic sense of control upon valley residents, and been in keeping with known Usumacinta Valley traditions.

It is from this perspective that the design of Rancho Santa Cruz can be understood. The site is designed with five large terraces, altogether representing a 50 meter high modification of the hill, which was already some 150 meters over the valley floor. Each is over 20 meters wide, and they vary in grade and area intensity. The terracing and modification of the Rancho Santa Cruz hill are evocative of the terraces of a massive pyramid, especially in the profile view which would have been visible from great distances (Figure X.X). While no intense quantity of facing stone has been found, it is likely that these terraces were combined with modifications of the hillside to produce an imposing visual force that would have been clear from all parts of the valley. It would have been labor intensive to produce these cuts in the hill, and have made an imposing final product which would emphasize the power of the ruling elite.

Despite the intensive terracing, there was not much additional construction at Rancho Santa Cruz. Only on the second terraces were any additional structures built. These three masonry structures were each about 4 meters long and one meter tall, and are aligned at 30 degrees east-of-north, and may also represent a triadic group. One of these has been looted, and the damage reveals that both the facing stones and fill are made of rock (Figure 2.35). Interestingly, their presence on the inner portion of the terrace means they cannot be seen from ground level, and would have been invisible to the broader population. Knowledge of their presence would be limited to those who were given permission to climb Santa Cruz – or who were informed of them by local elites. There are no L-Shapes or Patio Groups which are suggestive of households, and their triadic form and hidden position suggests they may have been restricted-use ritual structures.

Analyzing the design of Santa Cruz, and its relative position, it appears to occupy a very different structural role that the Hearthstones Group. While no ceramics were found to date the complex, a Preclassic date seems most likely. As compared to the Hearthstones group, and the clear emphasis on defense, it would have been difficult to secure Santa Cruz as a fortified settlement in the Classic Period. Even with additional construction, it would have been remained accessible for those will to traverse the mountain ridge, and attackers from this side would have had a beneficial position as they descended upon the lower terraces that contain structures. The presence of the structures on the 2nd terrace, in a position that would not have been useful as watch towers or defensive structures, suggests a lack of concern with active defense, and a more interest in local valley affairs – in keeping with the Preclassic model of the area surrounding Rancho Búfalo. Given the lack of settlement surrounding the hill, and its proximity to the Rancho Búfalo site center, it was likely a ceremonial complex run and administered by the same set of elites.

Discussion and Conclusion

Taken together, the El Vecino, Hearthstones and Rancho Santa Cruz occupations provide important context to Rancho Búfalo's regional role, and how its site occupants may have interacted with the valley. Rather than an isolated site center, we need to understand the well studied ceremonial core of the site as one in a series of several settlements. Each played a separate role in the maintenance of power by Preclassic site elites at Rancho Búfalo, and represent variable architectural adaptations in the broader political climate.

The ceremonial core of Rancho Búfalo which was delimited by shallow arroyos contained the primary public architecture which would have hosted ritual activities by the site elite. But this structures and rituals did not exist in a vacuum. At least one secondary settlement with its own public structure is present at El Vecino, and it is plausible that there are other in unexplored terrain. While El Vecino may represent the most prominent, it is certain that there was active occupation all around Rancho Búfalo, much of which may have been in the form of non-masonry “invisible houses,” or may have been low platforms that have been quarried for stone in modern times.

This valley population was under the rulership of Rancho Búfalo elites, and issues of maintaining that control and management were central to the development of Rancho Búfalo. This can be seen in the sequences of construction in public architecture from the site core that we studied in 2011-2014, but the presence of Rancho Santa Cruz adds an additional important element. Rancho Búfalo’s public architecture was designed to integrate the Preclassic population physically, and facilitate their presence through a series of plazas and other spaces for community building. Santa Cruz provided a separate but parallel line of population control. Instead of emphasizing a unified community presence, the highly developed set of terraces emphasized the separation between the controlling elites, and controlled population. Its panoptic and ever-present nature would have impinged directly on the local people and ensured a feeling of control was maintained – even when distant or out of viewshed from Rancho Búfalo itself.

While the complementary settlements and mutual visibility of Rancho Búfalo, El Vecino and Rancho Santa Cruz would have been crucial in the Preclassic period, with the major demographic and political changes of the Classic, the needs of the valley population changed dramatically. The Hearthstone Complex’s trilobed hill would have been ceremonially significant to the population of Rancho Búfalo, given its relationship to iconography, triadic groups, and narratives of the flower mountain. Entering the Classic Period, however, the uniquely defensible form of this hill would have been equally critical as its ritual connotations. On this basis, structures were built on top of each of the lobes, including a nearly closed off Patio Group. The only route to ascend to the patio group was additionally fortified, and a clear emphasis on defense can be read into both the position of these structures and the architectural design.

Overall, our explorations in the area directly surrounding Rancho Búfalo have been very useful in ascertaining the overall nature of valley settlement. Instead of viewing Rancho Búfalo as a Preclassic settlement in isolation, we can now understand how it related to the surrounding area.

Regional Reconnaissance

To investigate these interregional interactions and the processes of connectivity in the Preclassic Western Maya Lowlands of Chiapas surrounding Rancho Búfalo, two types of investigations were undertaken over the 2014 field season of the Proyecto Arqueológico Busiljá - Chocoljá (Figure A.93). The first was the investigation of a series of structures 11 km to the east of Rancho Búfalo which are on the mountain range bounding the eastern portion of the Usumacinta corridor, called Rancho El Milagro. The second was the walking survey of a mountain pass directly to the west of Rancho Búfalo which was used as an east-west conduit for ancient and modern peoples, called the Samaria Route. The study of the Samaria Route and the site center of El Milago serve as first datapoints in trying to understand Rancho Búfalo's impact on the broader Usumacinta River Valley. While its position at a cultural crossroads is clear, it is difficult to ascertain the specific relationships Rancho Búfalo had within the Usumacinta Region. These represent first steps in a broader undertaking to understand the story of Preclassic Chiapas, and the importance of Rancho Búfalo and other Usumacinta sites in the emergence of civilization in ancient Mexico.

Rancho El Milagro (Figures A.94 - A.100)

During reigonal reconissance surrounding Rancho Búfalo en 2013 Dobereiner encountered an archaeological site not previously documented called El Milagro. El Milagro i son a small range close to the community of San Lorenzo, Palenque. It had been cleared with fire and machete to créate a space for grazing of cows. The site is located on a hill with a large chert quarry, and consists of a group of platforms. From the site you can see all of the vallye to the south, including the áreas surrounding Rancho Búfalo, and the major hill of Rancho Santa Cruz. The site also has easy access to the Chocoljá River.

PABC Project members returned to the site in 2014 with the goal of documenting the structures which became visible due to the process of clearing terrain for cattle. Overall, two primary structural groups were found, both oriented at 30 degrees east-of-north, as is common at other Usumacinta sites. The overall morphologies of these two structure groups were entirely different. El Milagro Group A consisted of a single substantial platform, on top of one of the highest peaks in the area, with a very clear view of the entire North-South Usumactina Valley (Figure 3.2, 3.3). People on this platform would have been able to see the entire region, including Rancho Búfalo and surrounding centers and watchtowers on the Eastern range bounding the Valley (Figure 3.4). The choice to build a very large platform was likely a function of their own desire to "be seen" with an impressive construction, and a series of disordered stones lower than the platform itself may indicate artificial terracing or covering of the mountain side, to increase the apparent size of this built construction. This structure has been looted in modern times, and appears to have a breached tomb (Figure 3.5). The basic construction style appears to be Classic, though no ceramic fragments were found surrounding the intrusion, and it was not possible to confirm the chronology.

El Milagro Group B was approximately 200 meters distance from Group A, and contains a more complex structure set, including an apparent L shaped platform and a series of smaller buildings (Figure 3.6, 3.7). The geographic position of the structures precludes visibility of the mountain range area. The L shaped structure, in keeping with known Maya household styles, may represent a residential structure, and its supporting structures. Unfortunately, no ceramic was found in the area, but the architectural forms of Group B also appear to be from the Classic Period.

Group A and Group B were the only apparent masonry or mounded architecture in the area, and likely represent the extent of people living at El Milagro. They had access to two sets of material. The first is the viewshed from Group A, which would have been a valuable contribution to regional sites, and may have allowed signaling to other mutually visible watch towers. The second is a very substantial chert outcrop, which covers the entirely western face of the hill on which these groups lie (Figure 3.8). While no clear production debitage was recovered, many of the stones appear to have undergone anthropogenic processes to remove cortex and exposed the utilitarian lithic material within. Taken together, we would suggest the visible masonry architecture present at El Milagro dates from the Classic Period, but the important resources make likely a possible earlier Preclassic occupation which would be revealed through a process of excavation and further exploration.

Regional Reconnaissance Walk to Samaria (Figures A.101 - A.103)

Given Rancho Búfalo's key position along East-West passes through the Lacandon Mountain Range, understanding the nature of how it connected surrounding River Valleys and X is of paramount interest in reconstructing its role during the Maya Preclassic. While Rancho Búfalo dominates the closest passable valley parallel to the east of the Usumacinta River which now contains highway number 307, there was also extensive Pre-Columbian occupation in the next valley to east, highway number X. We chose to investigate the clearest East-West mountain pass from GIS imagery of Rancho Búfalo, which is located directly to the west of the site (Figure 3.2, 3.9).

Highway 307 was only constructed in the last 20 years. Highway X was constructed first, and represented one of the first high speed means to travel in and out of the Usumacinta River Valley in Chiapas. People from the modern town of Flores Magon, Palenque, Chiapas, the closest community to the archaeological site of Rancho Búfalo, actively utilized this mountain pass as a means of accessing the town of Palenque and leaving to other parts of Chiapas. On this basis, there is extensive local knowledge about walking the mountain pass, and considerable oral history about its importance (Figure 3.10).

We chose to do a walking survey of the mountain pass to seek archaeological remains and structures that may have been used to control it. While it would have been critical during the Preclassic, the strategic use of walls to defend narrow and controlled channels has been documented by Golden and Scherer throughout Chiapas and Petén, Guatemala, and a secondary goal was to seek palisade foundations and defensive works which may have been used by the Palenque or Piedaras Negras polities during the Classic Period. The entire length of the pass was approximately 12 km, and it still required extensive climbing.

Both the slope and any surrounding structures on the Samaria-pass were modified and obliterated by an early 20th century railroad which utilized this route to transport material west from the Usumacinta River. While the tracks have been removed, extensive gravel routes and various iron train remains still litter the pathway (Figure 3.11). Any possible palisade walls would have been destroyed in this process, but no clear watch towers or larger masonry structures were apparent along the route either. This suggests that the Samaria-pass may not have been extensively controlled during the Classic Period.

At the terminus of the Samaria-pass is the modern *ejido* of Samaria itself. Samaria is a small community, and we had not received prior permission from the *consejo* to perform archaeological reconnaissance or explore the center. Luckily, we were still welcomed by the community, and told about recent finds and the nature of the town construction (Figure 3.12). According to local residents, extensive archaeological materials are recovered with regularity from the growth of the community. Individual structures often seemed to be placed directly on top of mounds, and it seems that a Pre-Columbian town of equal or greater size than Rancho Búfalo.

While we were not able to excavate at Samaria, we are able to suggest a Preclassic date for its occupation based on two lines of evidence. The first in a small number of sherds which were visible around site structures. They appeared to be waxy red sherds in line with the Chicanel or Mamom ceramic spheres that characterize Preclassic ceramics of the Maya area and Rancho Búfalo. Our other line of evidence is more tenuous, but involves descriptions by Samaria residents of what they sometimes fine in the process of building their homes. Serpentine or greenstone celts, the likes of which are considered common in the Preclassic Maya and Olmec area, around found intermittently. Unfortunately, we were not able to see any of these objects while in the town.

Samaria appears to have been a Preclassic center located opposite this important East-West mountain pass. It likely operated as a sister-center which may have collaborated with Rancho Búfalo to coordinate trade and control of foot traffic between the major North-South river valleys along the Usumacinta River. Further investigations of this site center, and the area surrounding Rancho Búfalo more broadly, may further elucidate the nature of control and interaction during the earliest phases of the Usumacinta River occupation in Chiapas.

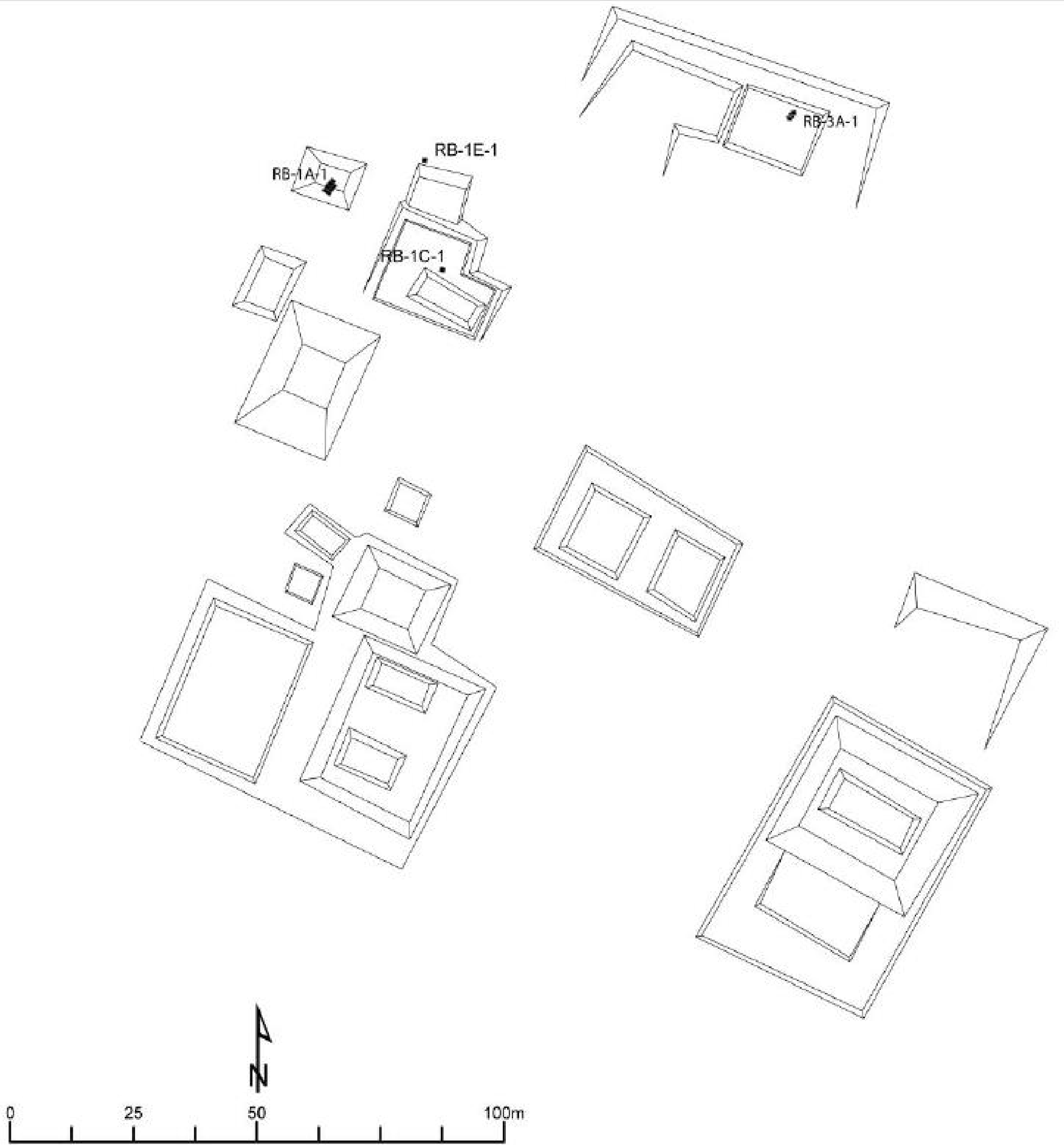


Figure A.1 Map of 2011 excavation operations at Rancho Búfalo (Map by J. Dobereiner and C. Golden)

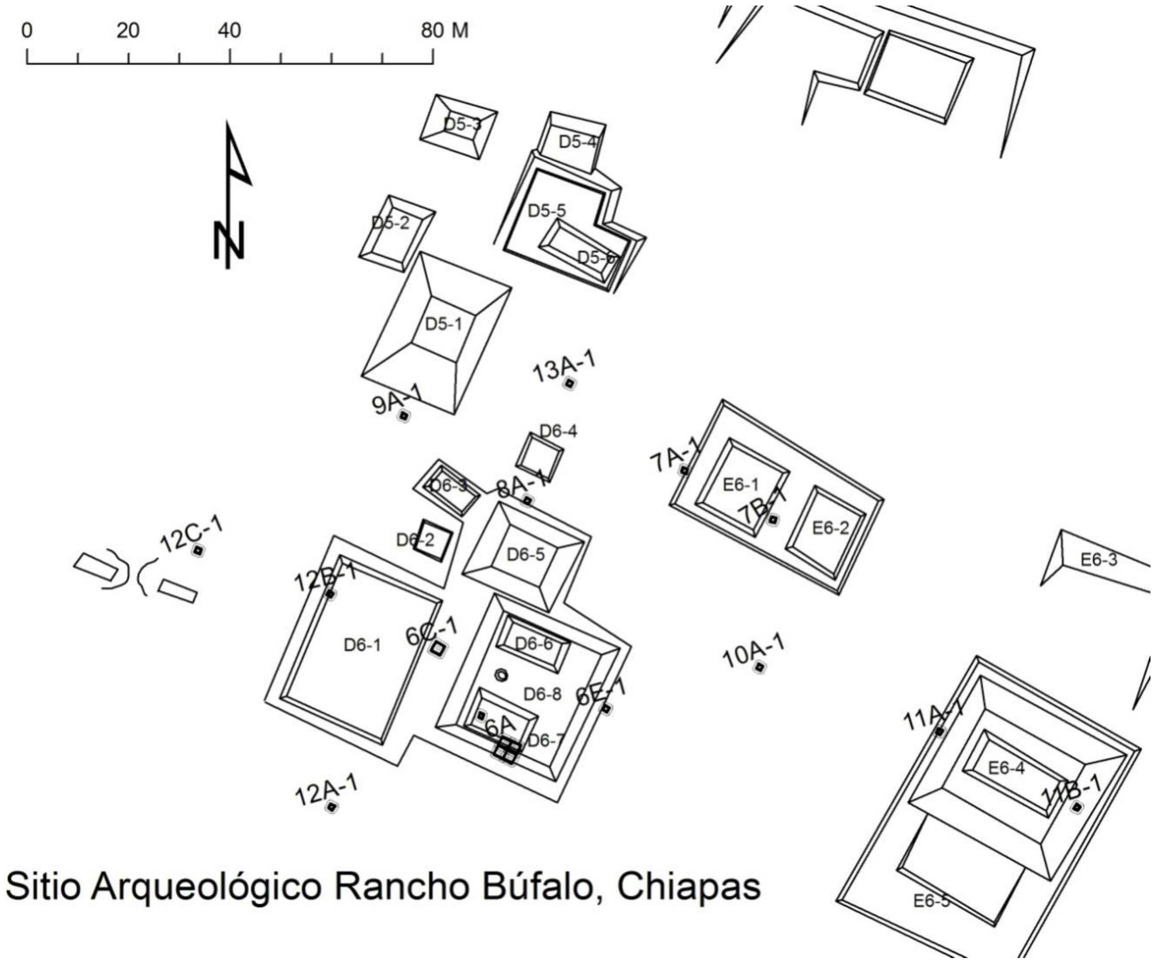


Figure A.2 Map of 2012 excavation operations at Rancho Búfalo (map by J. Dobereiner, C. Golden, and B. Davenport)

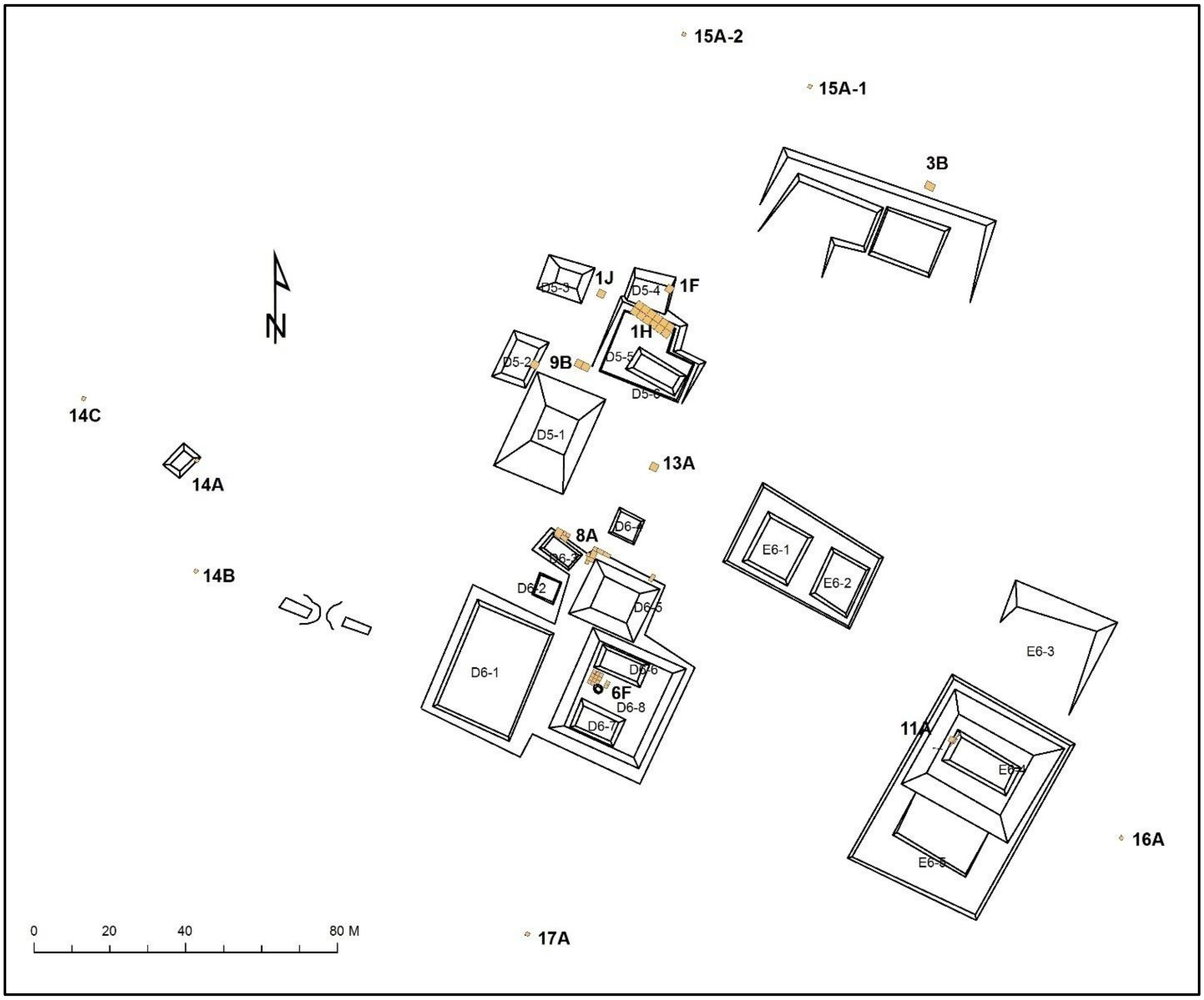


Figure A.3 Map of 2013 excavation operations at Rancho Búfalo (map by J. Dobereiner, C. Golden, and B. Davenport)

Figure A.4 N-S profile drawing of Rancho Búfalo Burial 1, Structure D5-3 (Op. 1A) (J. Dobereiner)

Figure A.5 Cylinder vessel from Rancho Búfalo Burial 1 (Photo by C. Golden)

Figure A.6 Shell earrings and bone needle from Rancho Búfalo Burial 1 (Photo by A. Scherer)

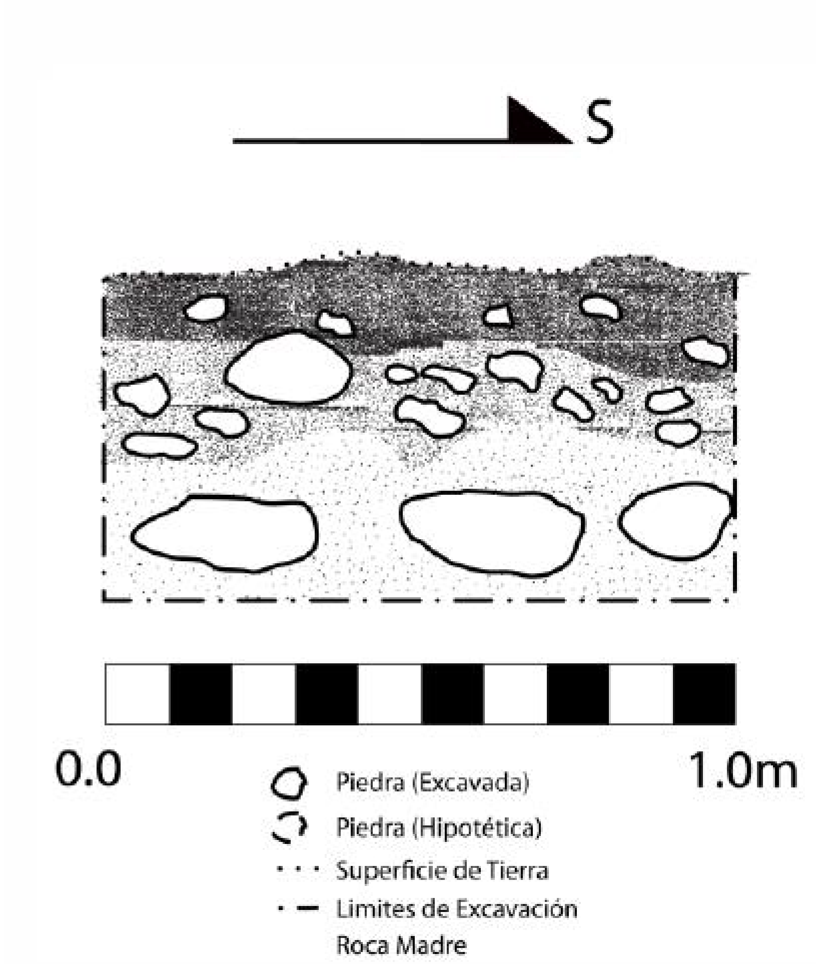


Figure A.7 Unit profile of RB-1C-1 (Drawing by A. Mendez and A. Scherer).

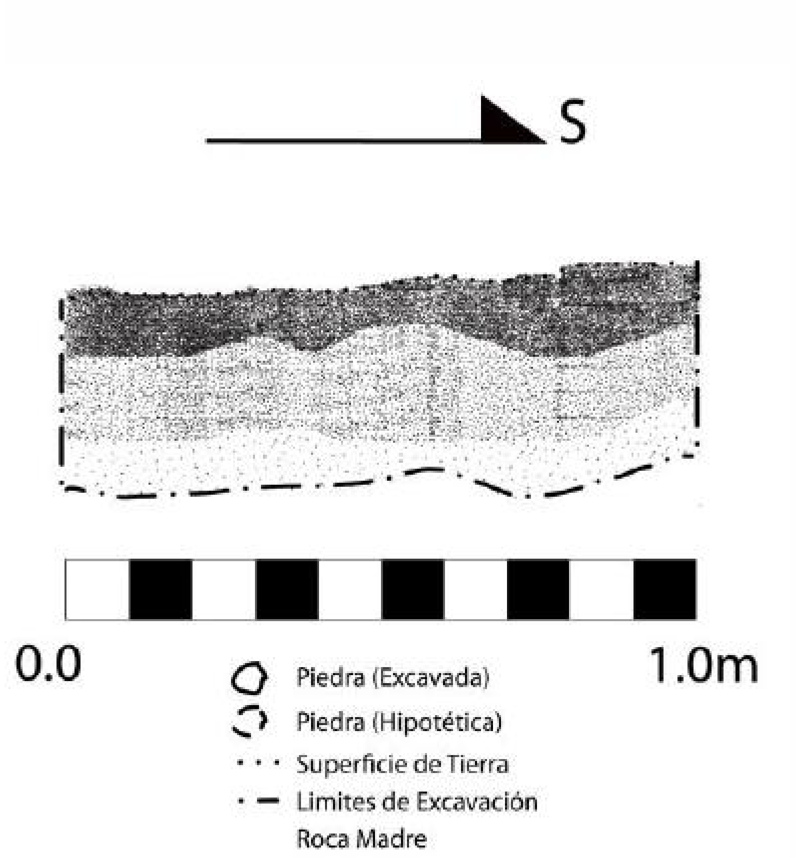


Figure A.8 Unit profile of RB-1E-1 (Drawing by A. Mendez and A. Scherer).

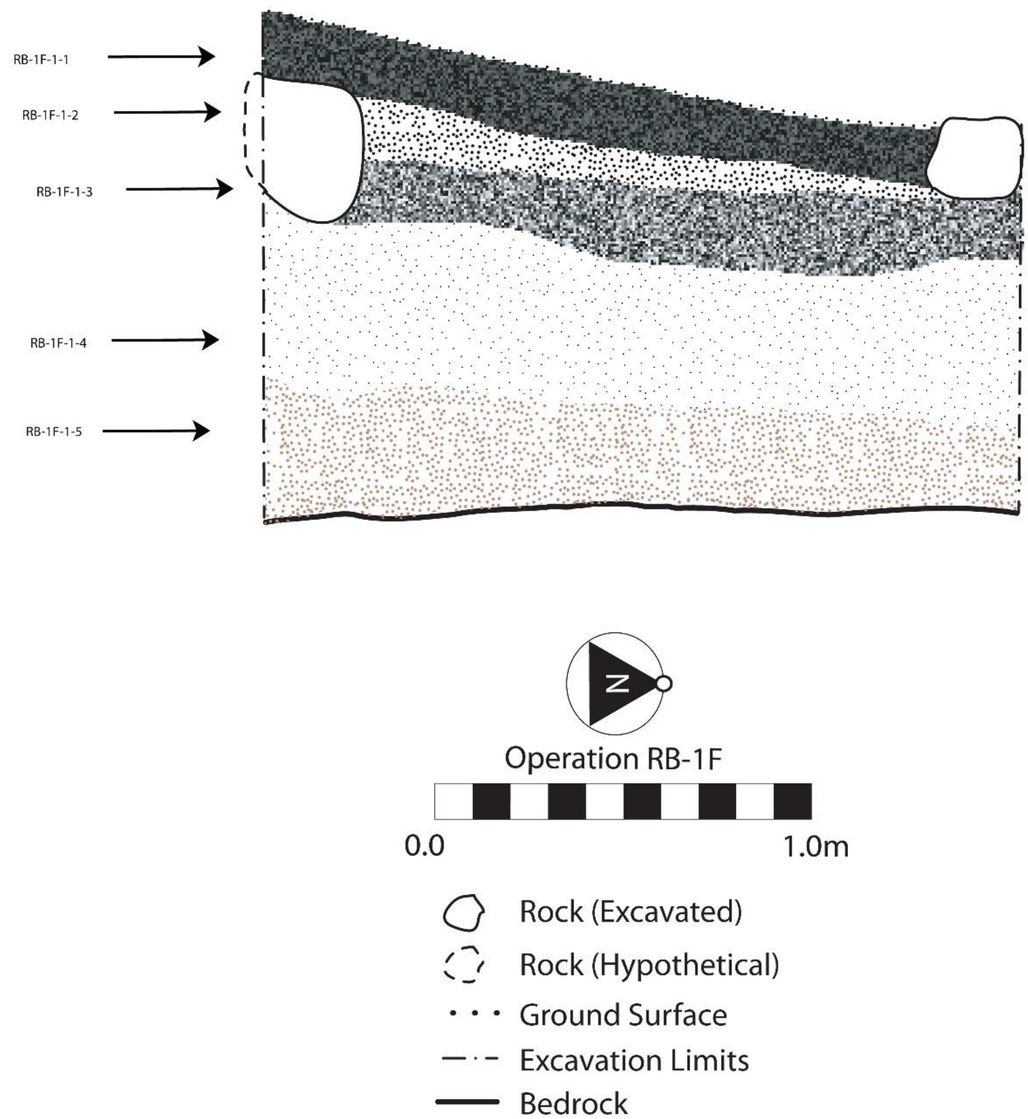


Figure A.9 Unit profile of RB-1F-1 (Drawing by J. Dobereiner).

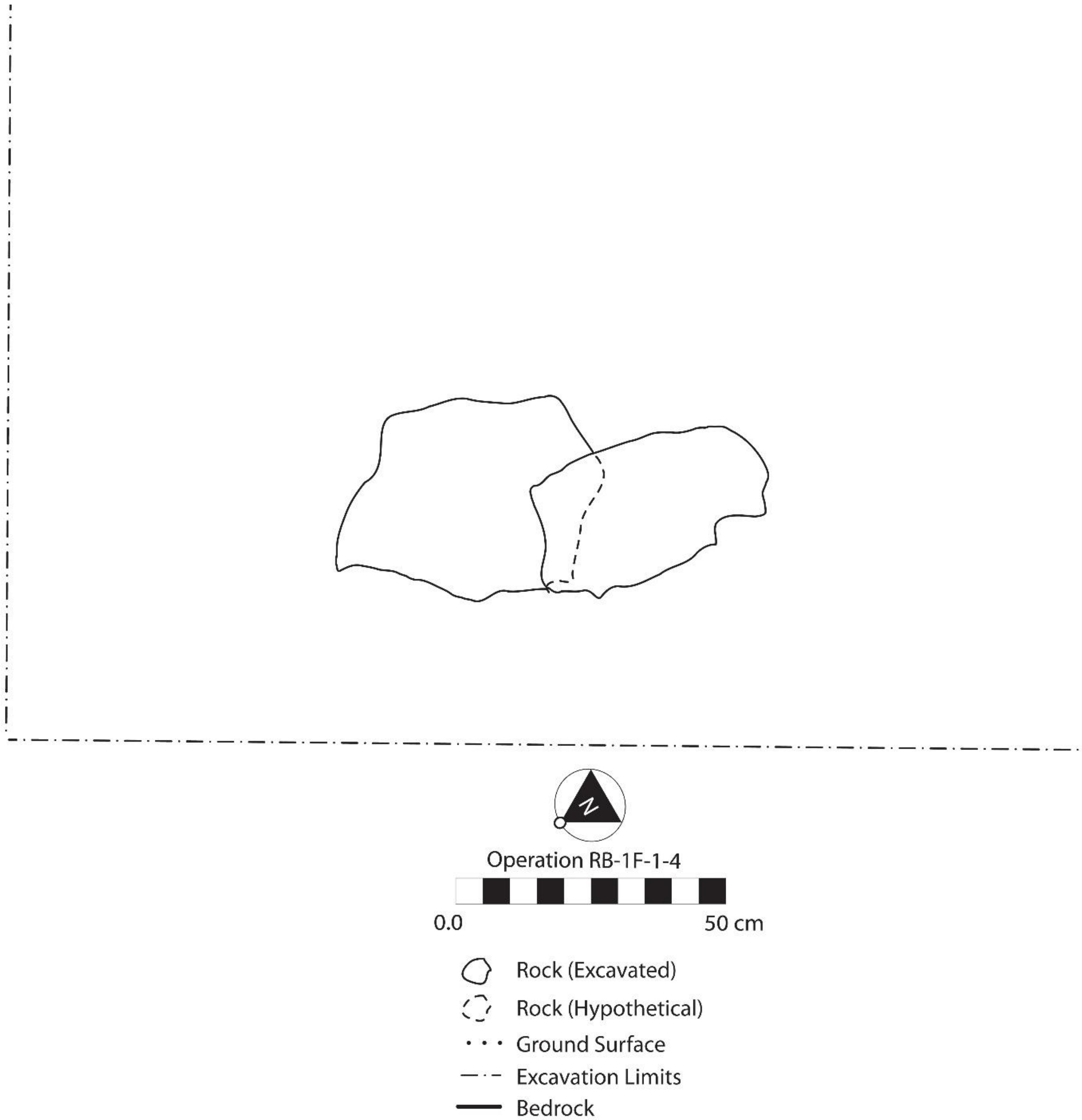


Figure A.10 Pair of stones on top of Burial 4 in RB-1F (Drawing by J. Dobereiner)

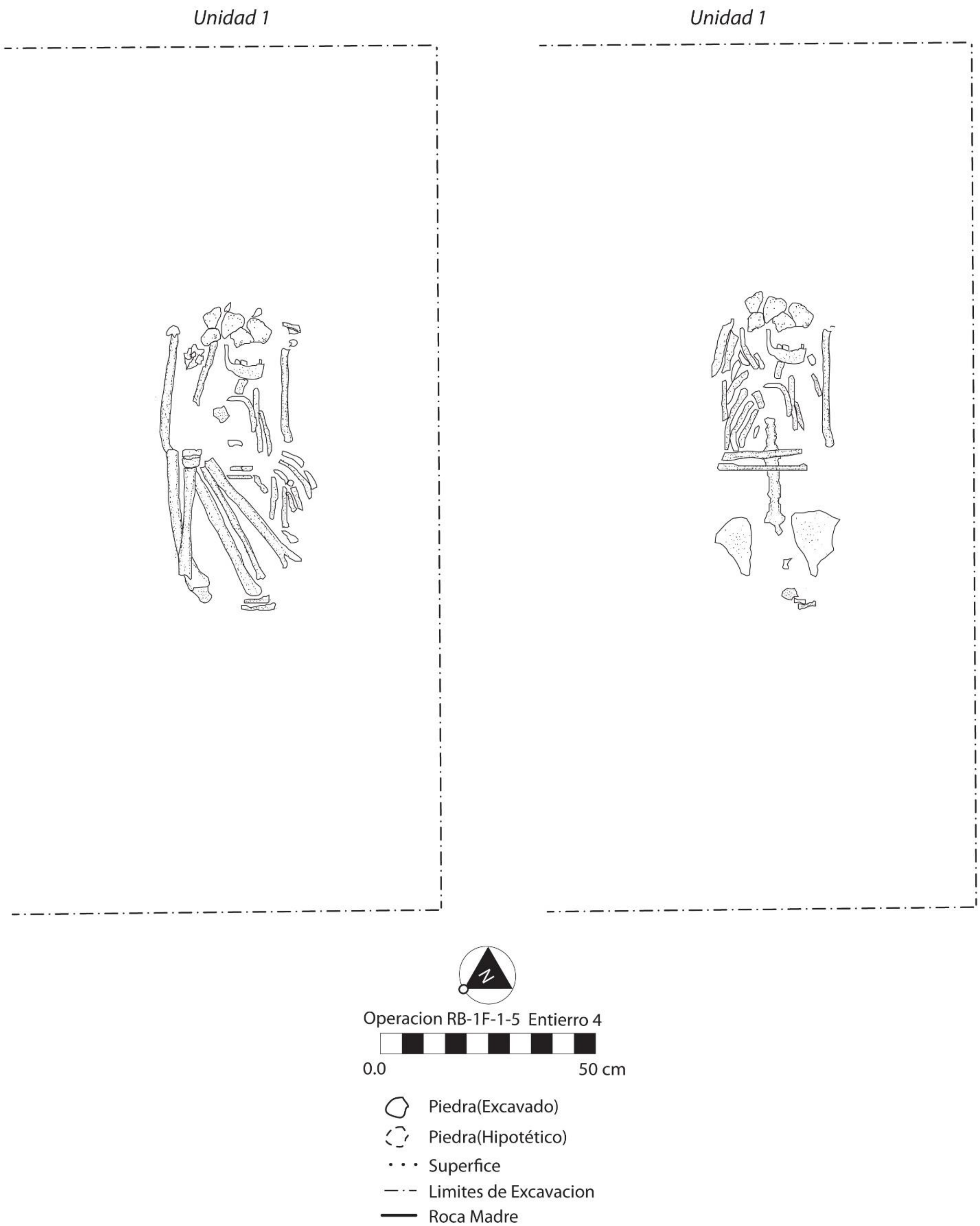


Figure A.11 Burial 4 in RB-1F, phase1 of excavation (left) and phase 2 of excavation (right) (Drawing by Y. Cabrera and J. Dobereiner)

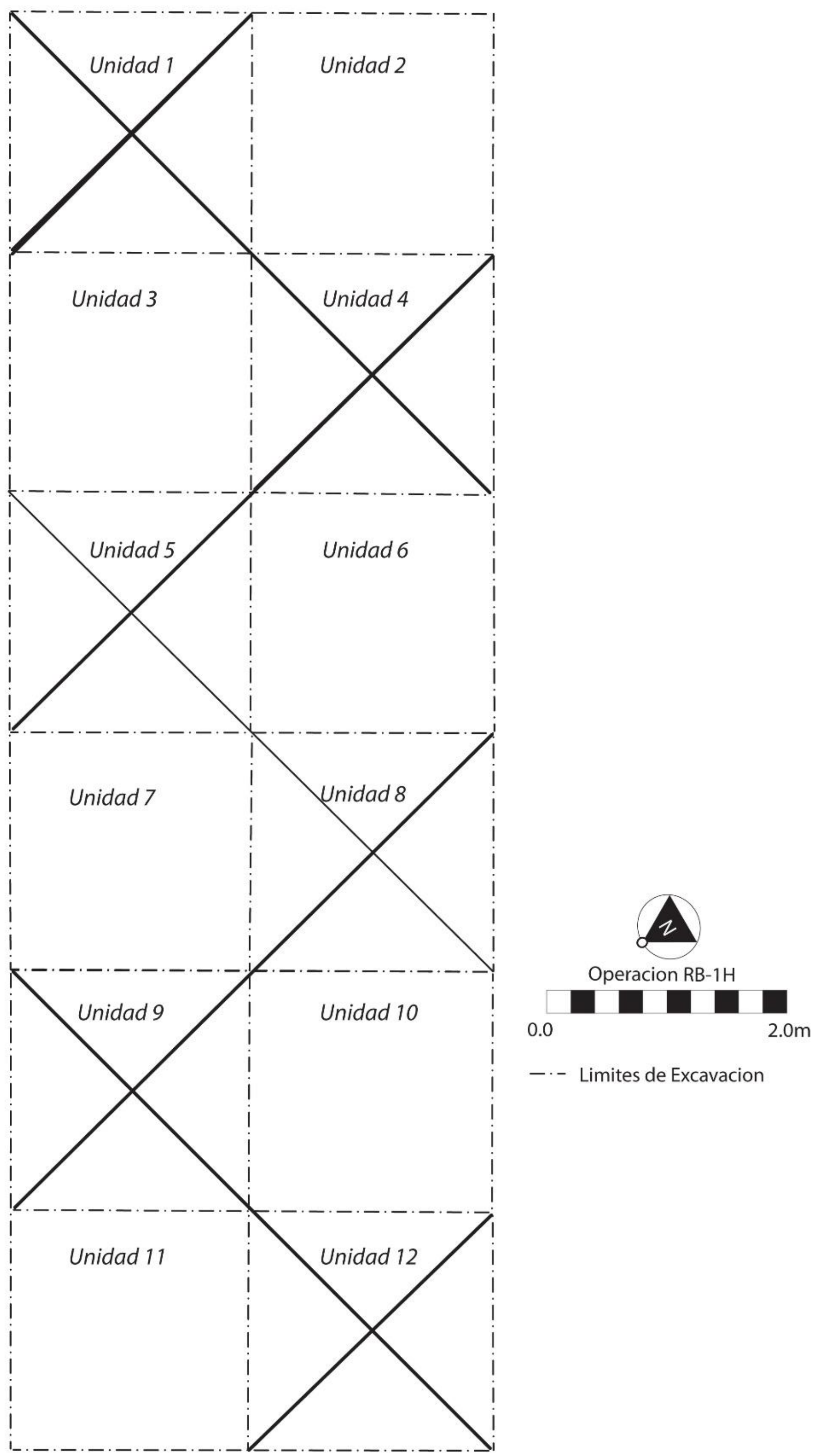


Figure A.12 Locations of units in Operation 1H, with exes where excavations were opened (Drawing by J. Dobereiner).

Figure A.13 Plan view of Operation 1H: 1, 4, 5, 8, 9, 12 (Drawing by Y. Cabrera and J. Dobereiner).

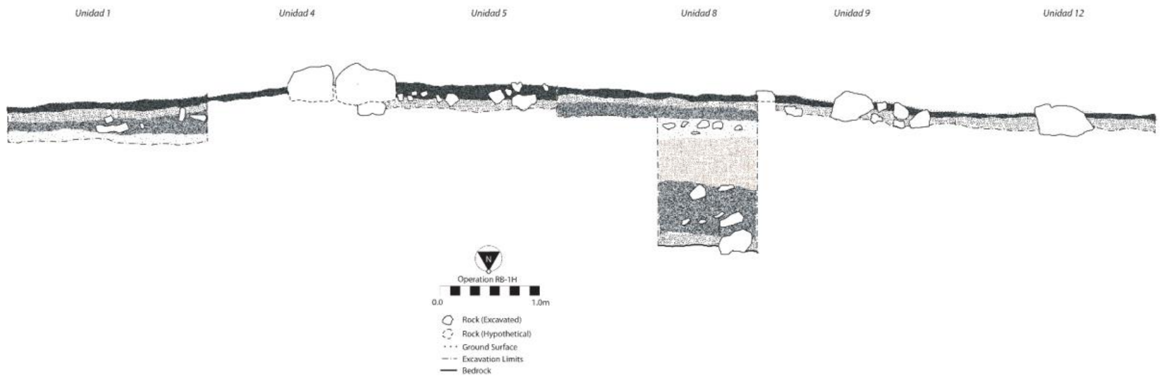


Figure A.14 Profile of excavated units in Operation 1H: 1, 4, 5, 8, 9, 12, the central line, east-west (Drawing by Y. Cabrera and J. Dobereiner).

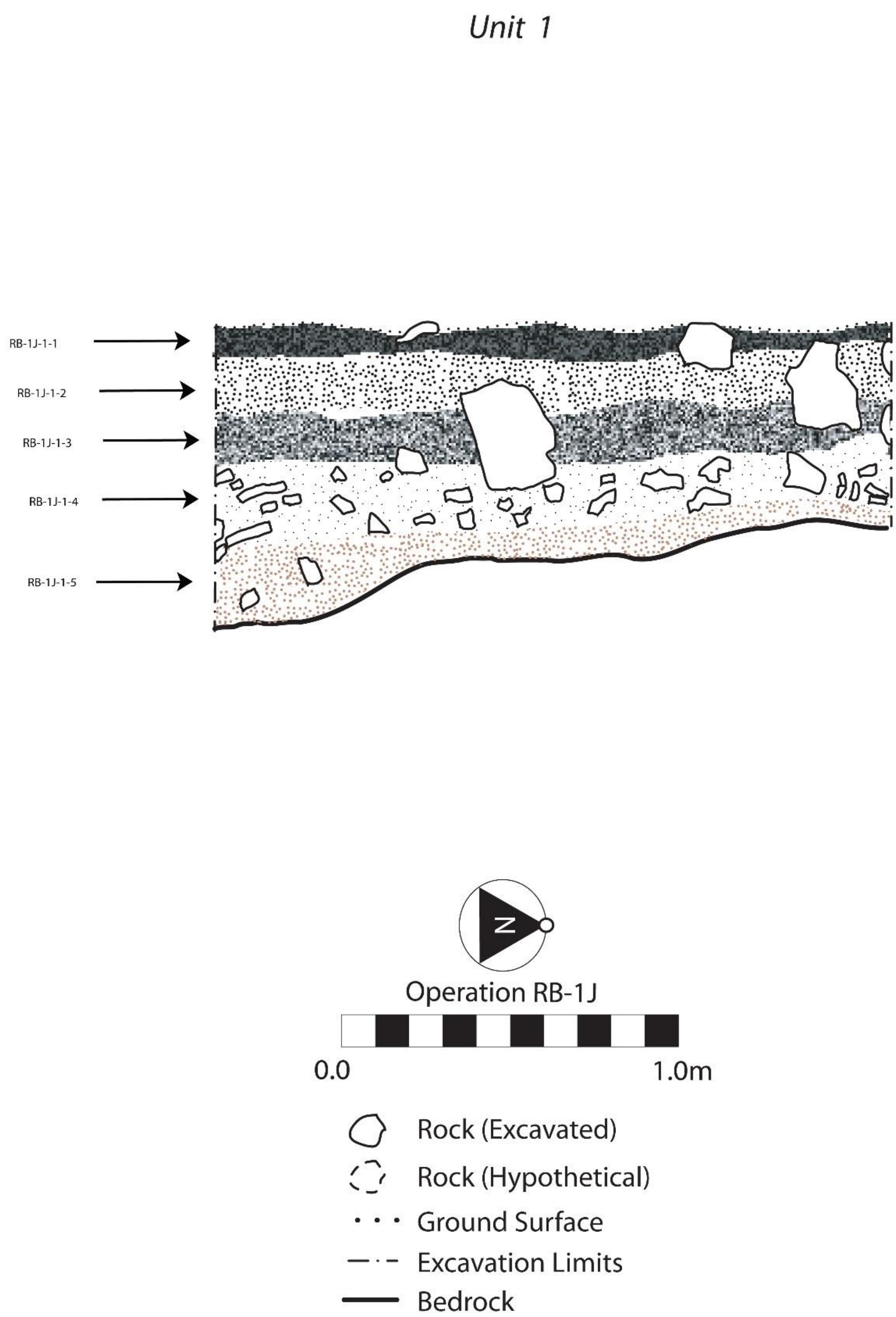


Figure A.15 Unit profile of RB-1J-1 (Drawing by O. Molina and J. Dobereiner).

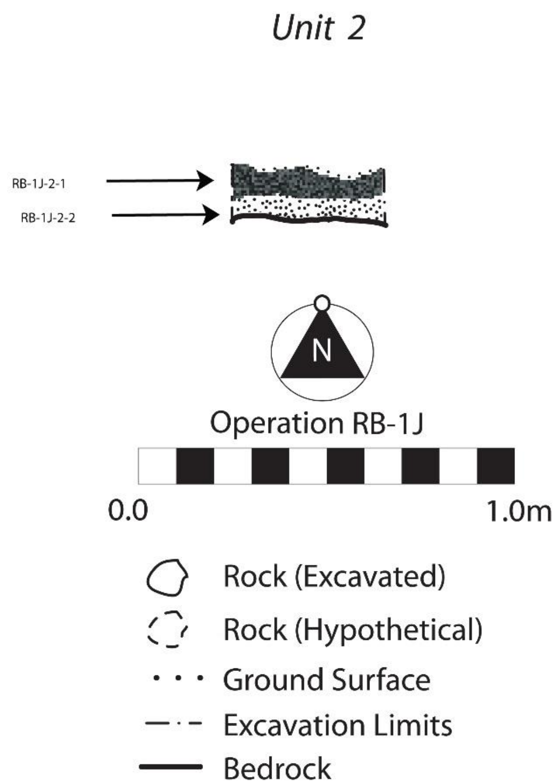


Figure A.16 Unit profile of RB-1J-2 (Drawing by J. Dobereiner).

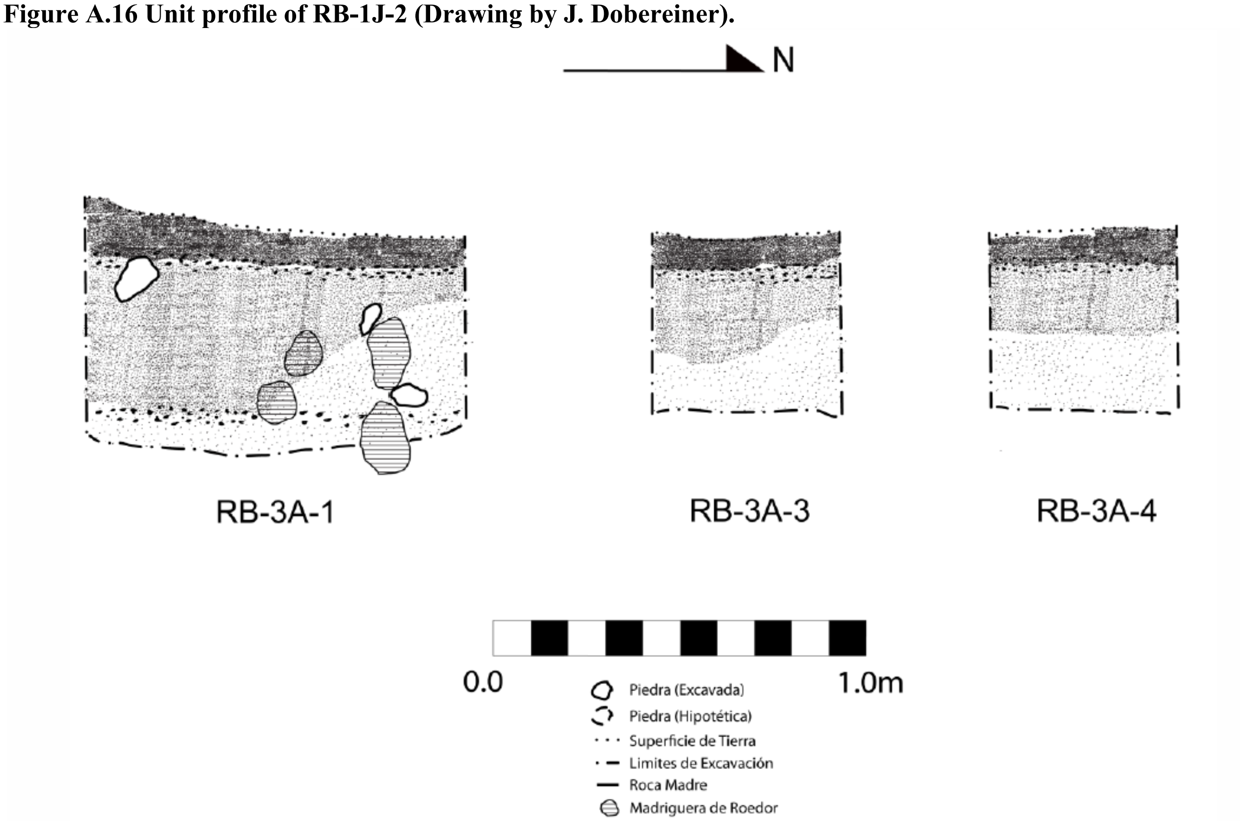


Figure A.17 Unit profile of units RB-3A-1, RB 3A-3 and RB 3A-4 (Drawings by A. Mendez and A. Scherer).

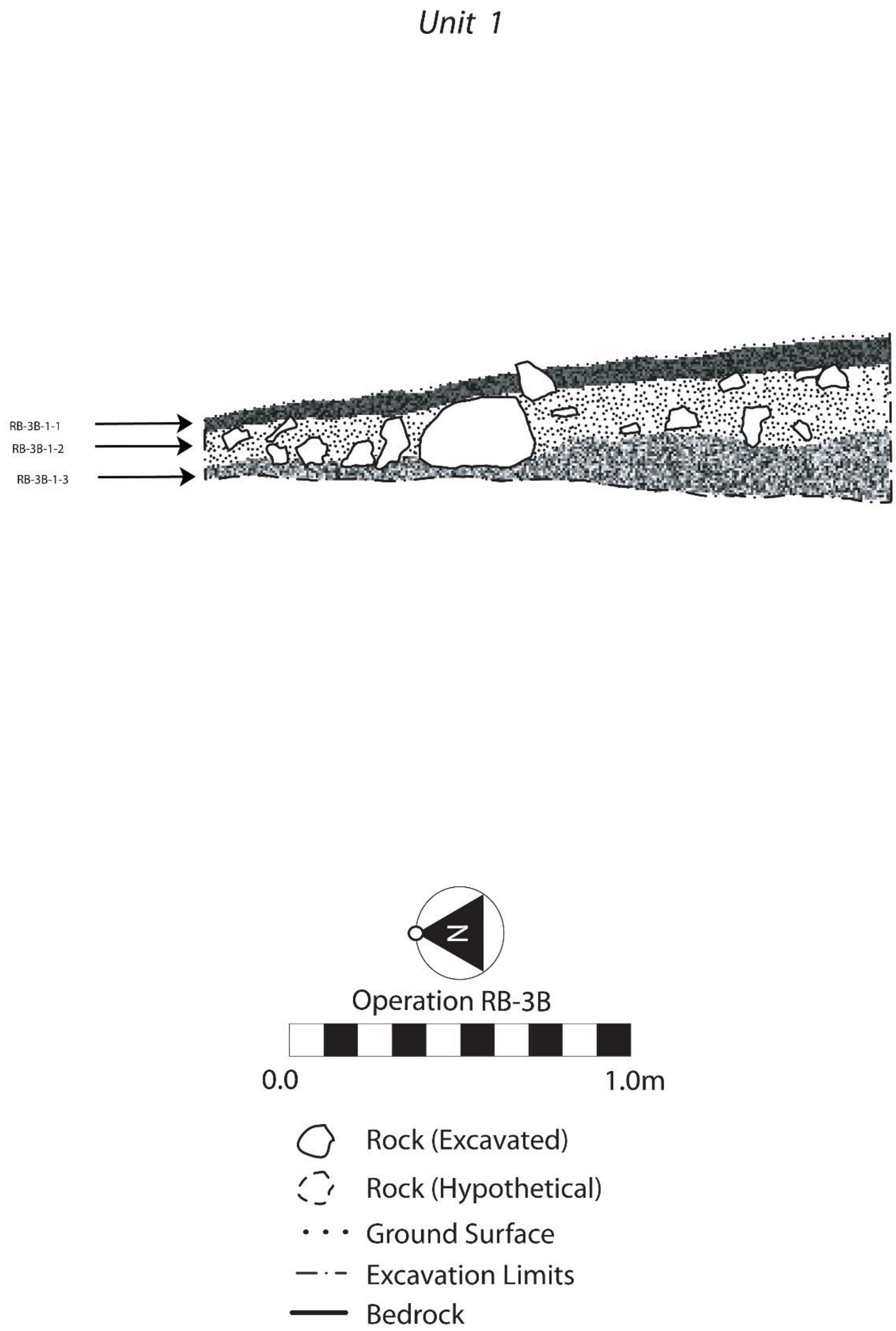


Figure A.18 Unit profile of RB-3B-1 (Drawing by J. Dobereiner and O. Molina).

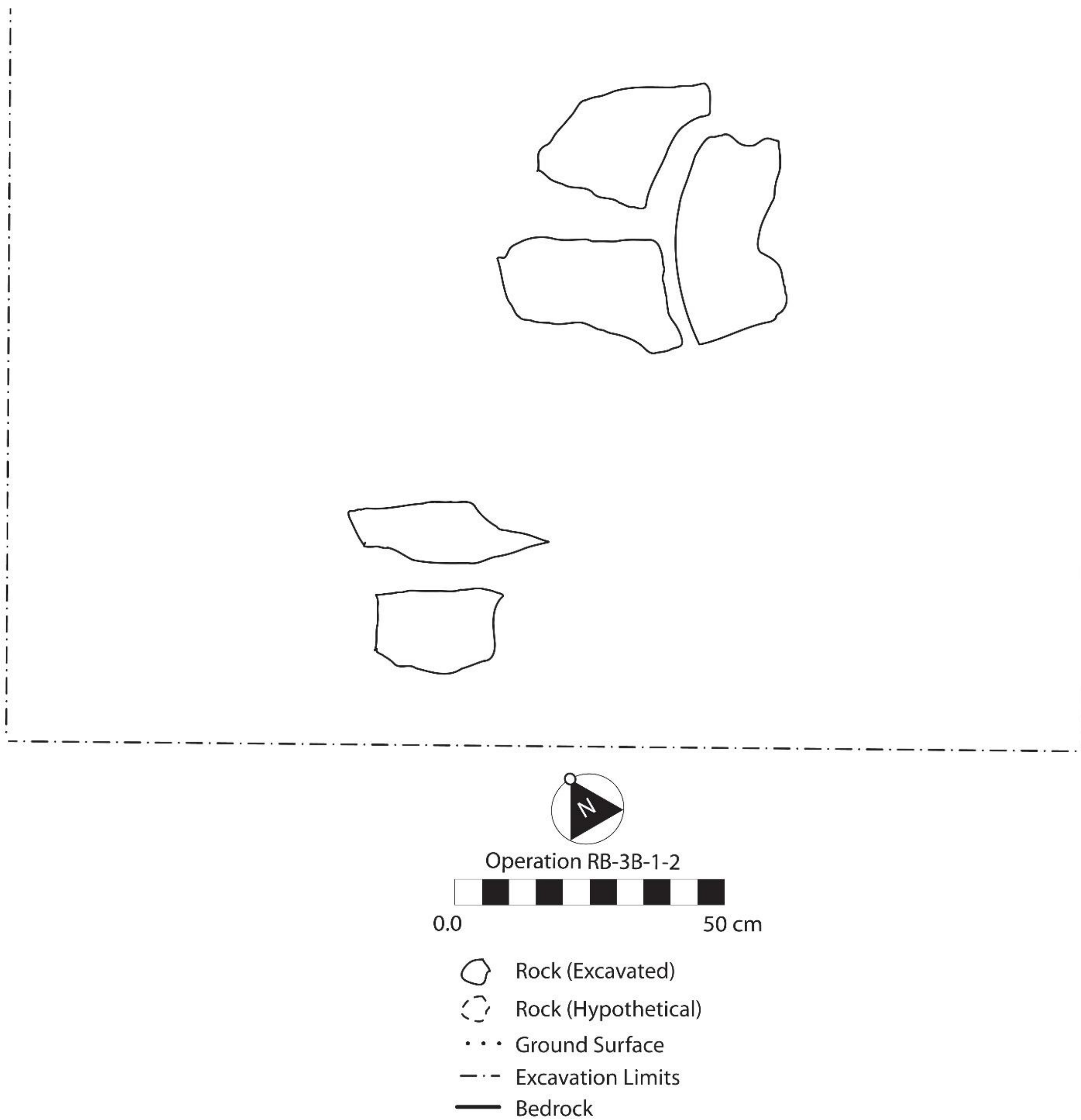


Figure A.19 Drawing of stones covering a likely unexcavated burial in RB-3B (Drawing by J. Dobereiner).

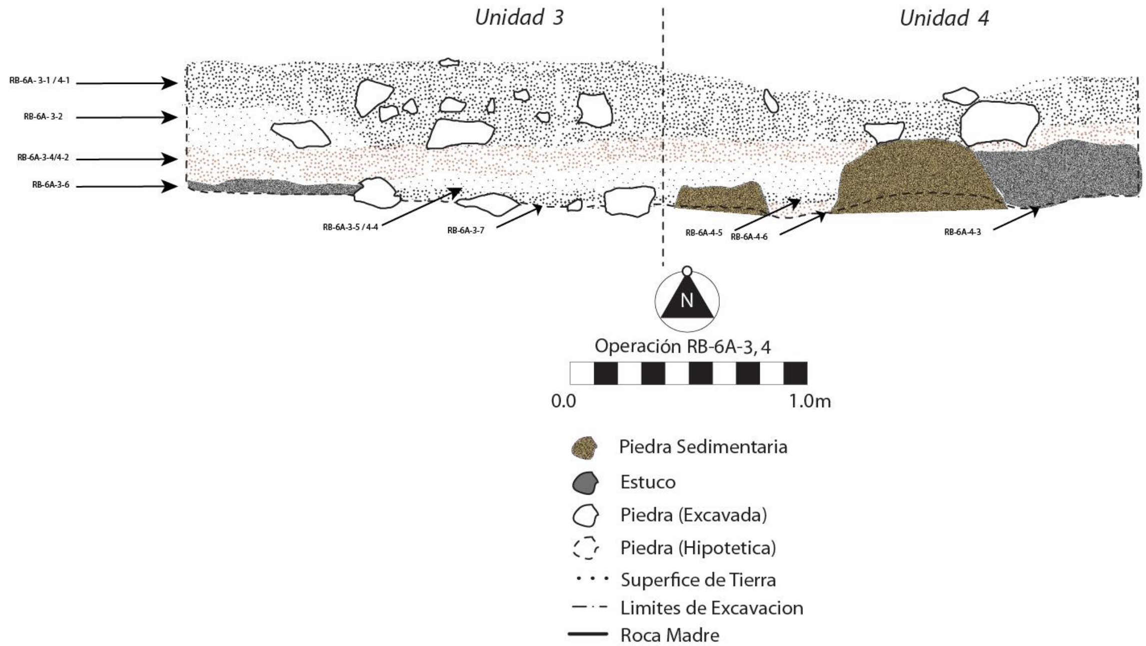


Figure A.20 Profile of the units RB-6B-3 and 4 showing profiles of large sedimentary stones that comprise steps (Drawing by J. Dobereiner).

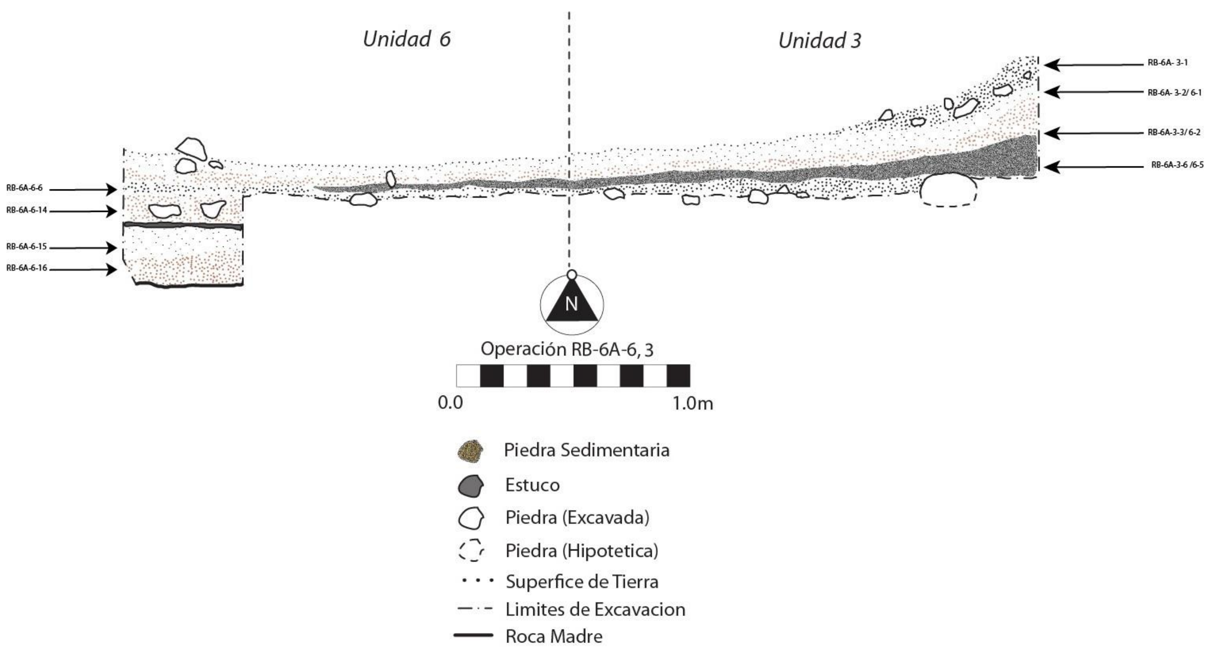


Figure A.21 Profile of the units RB-6A-3 and 6, with intact floor (Drawing by J. Dobereiner).

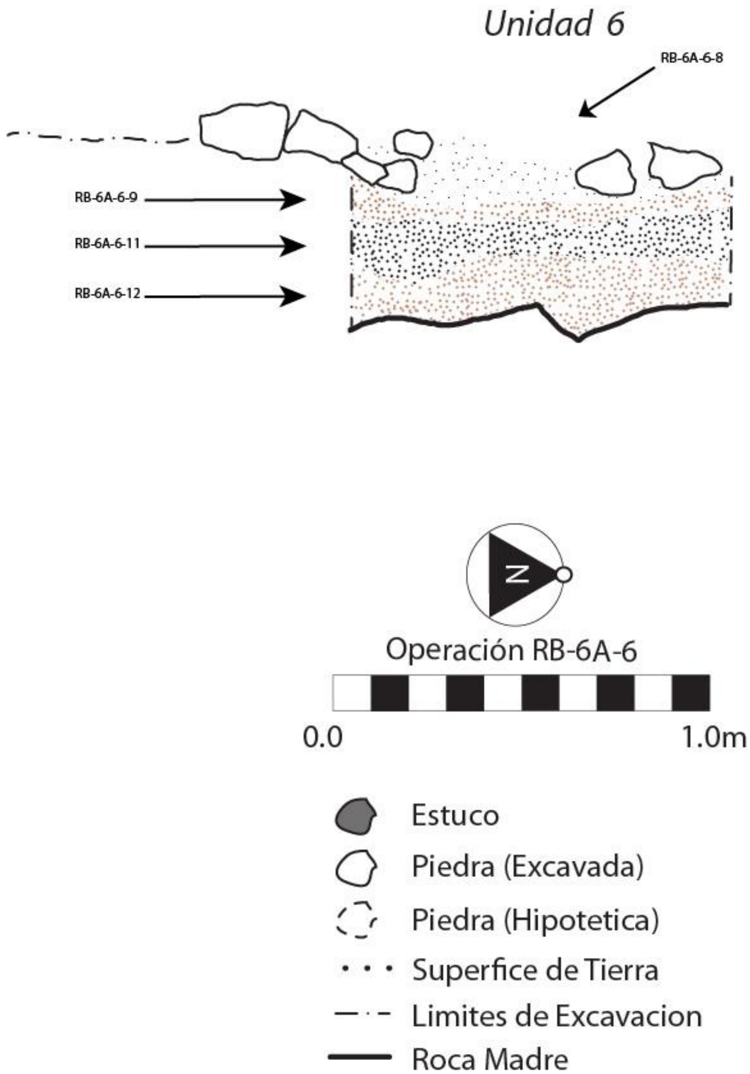


Figure A.22 Profile of unit RB-6A-6 (Drawing by J. Dobereiner).

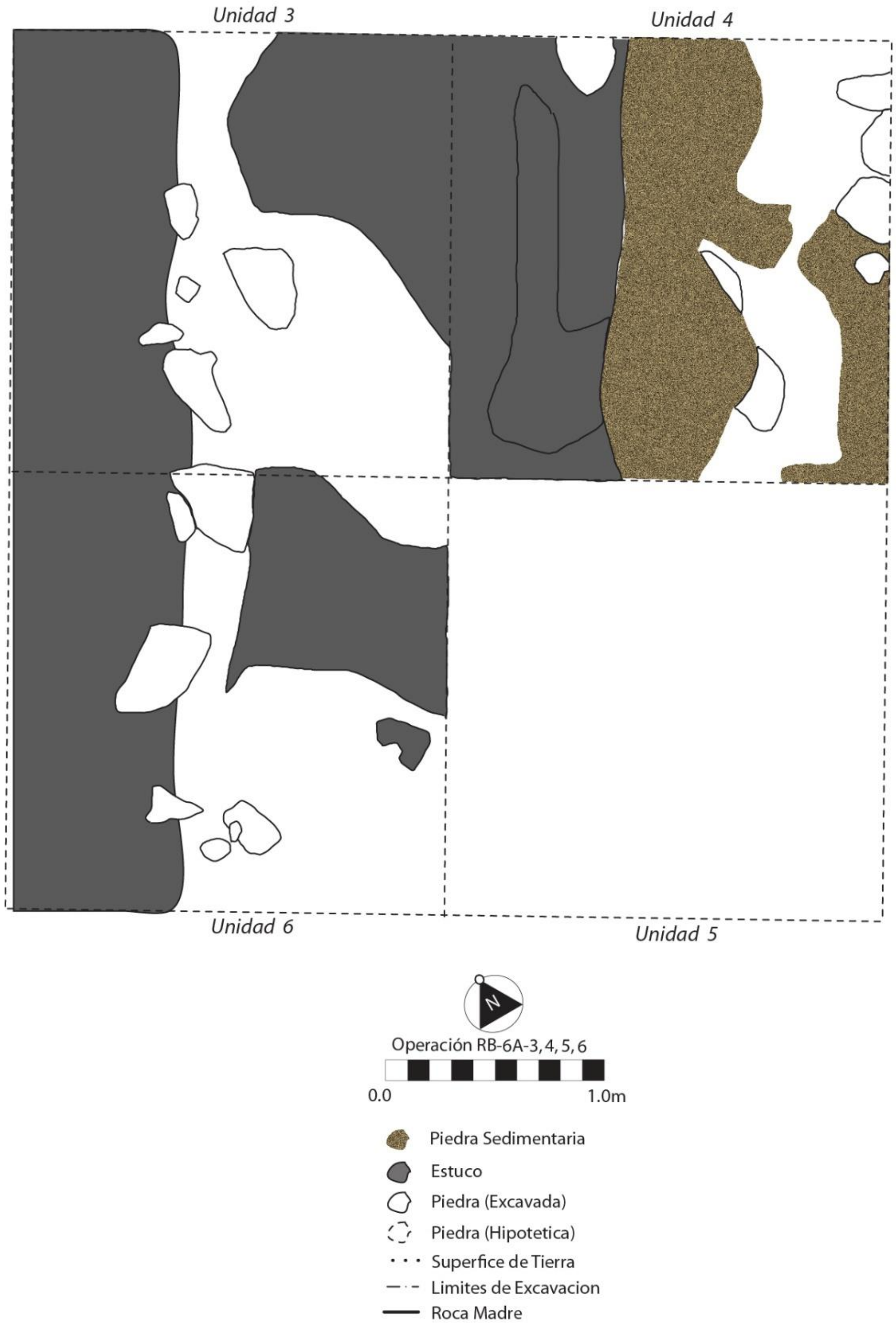


Figure A.23 Plan of the units RB-6A-3, 4, 5, 6 before removing plaster floors (Drawing by A. Méndez Cab and J. Dobereiner)

Figure A.24 Plan of the units RB-6A-3, 4, 5, 6 after removing plaster floors (Drawing by J. Dobereiner)

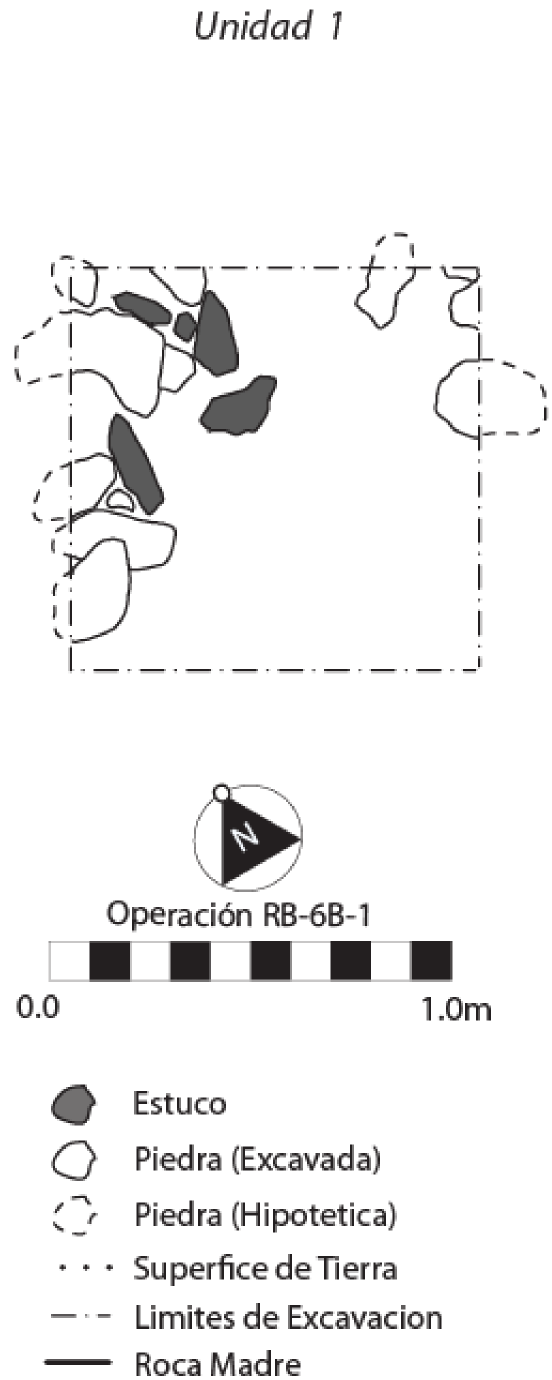


Figure A.25 Plan of RB-6B-1-1, cleaning a small looters pit (Drawing by A. Delgado and J. Dobereiner).

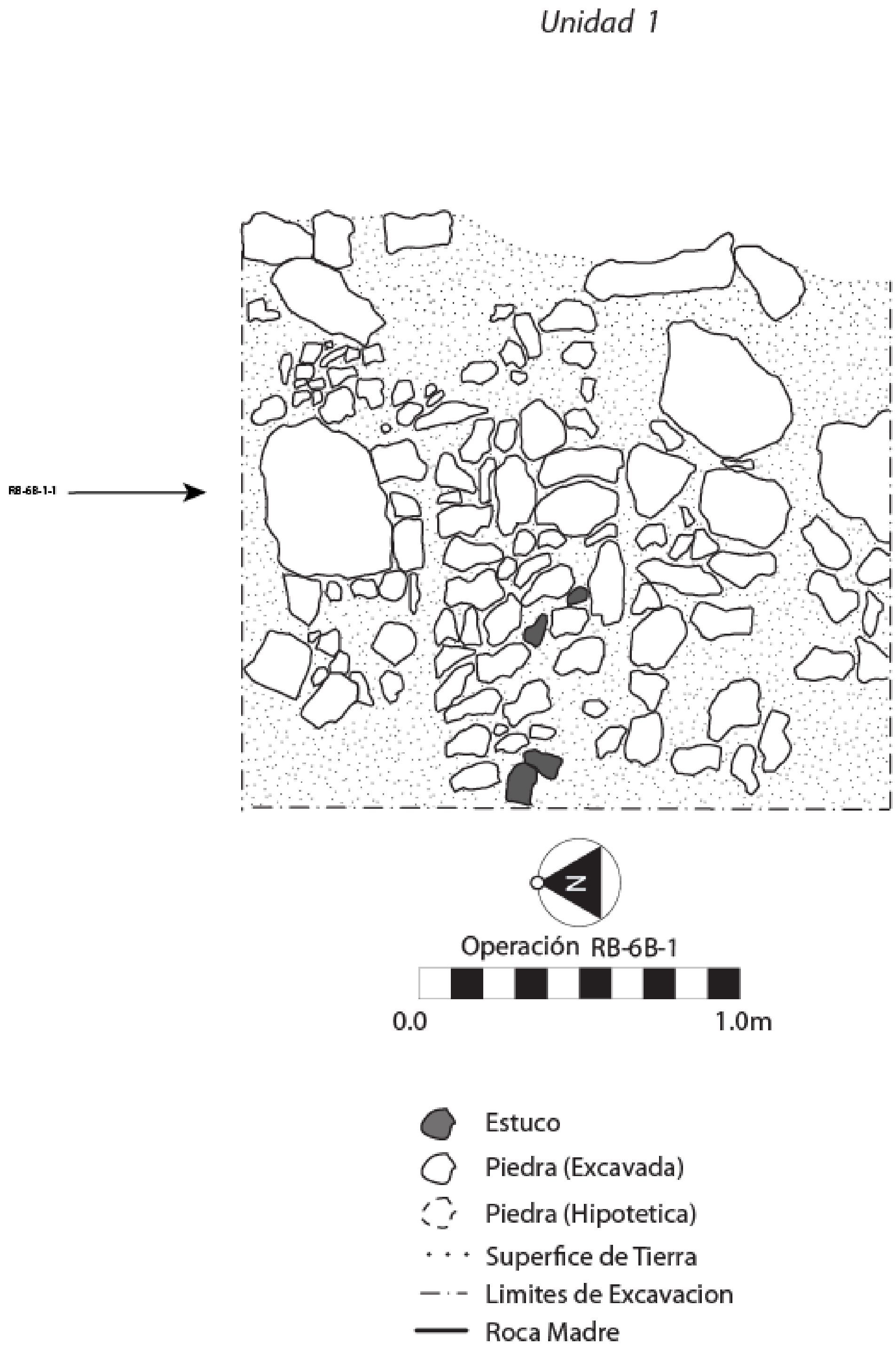


Figure A.26 Profile of unit RB-6B-2, cleaning a small looters pit (Drawing by A. Delgado and J. Dobereiner).

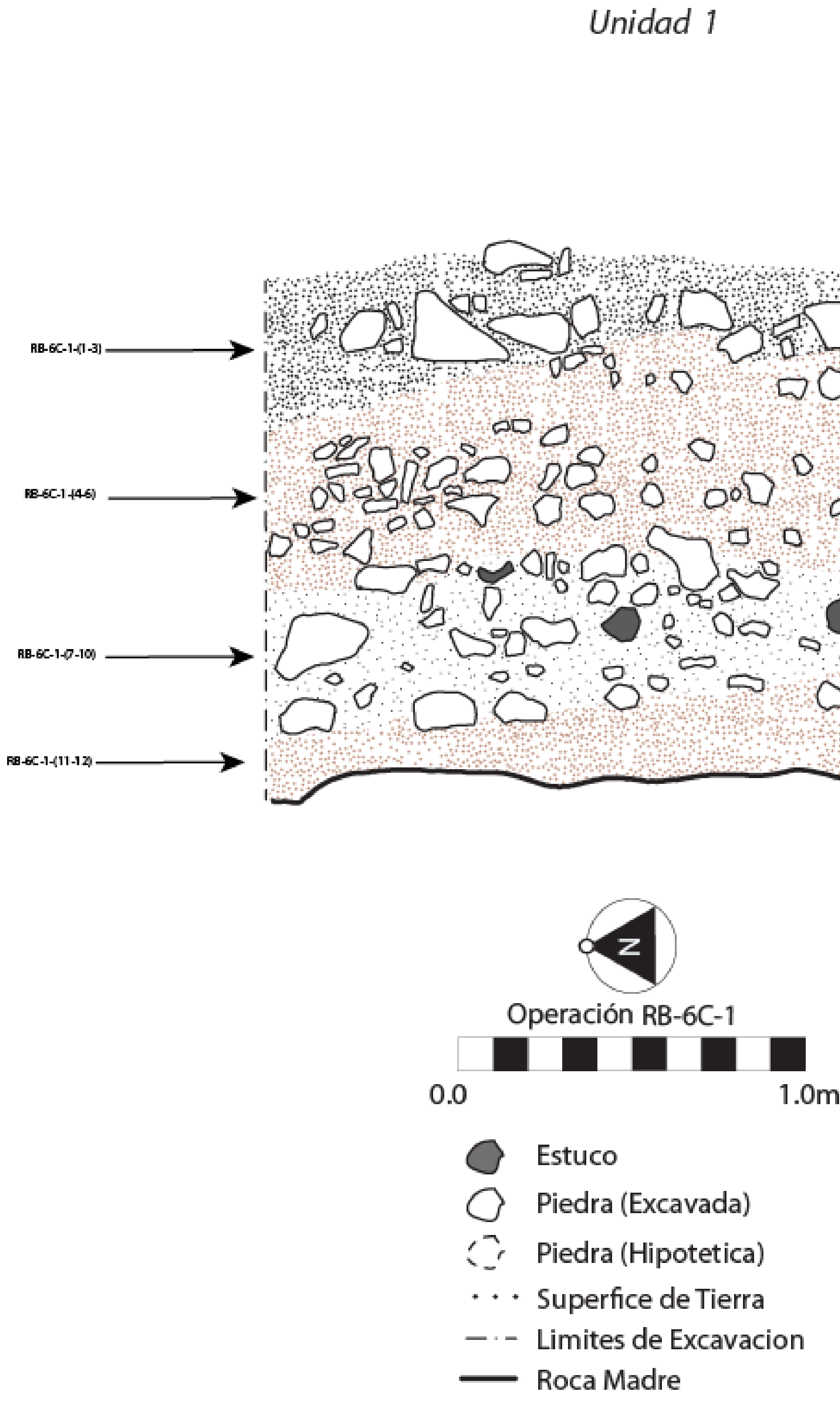


Figure A.27 Profile of unit RB-6C-1 (Drawing by A. Delgado and J. Dobereiner).

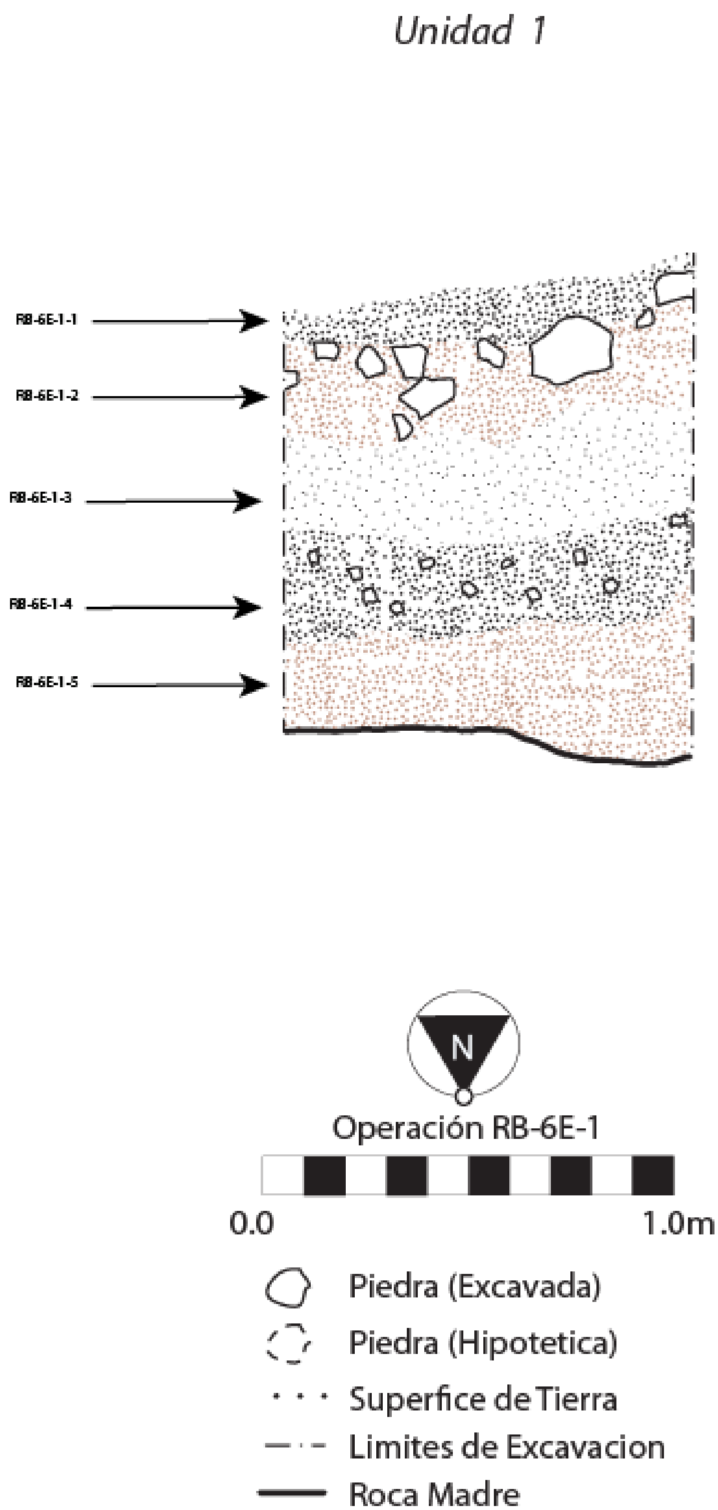


Figure A.28 Profile of unit RB-6E-1 (Drawing by J. Dobereiner).

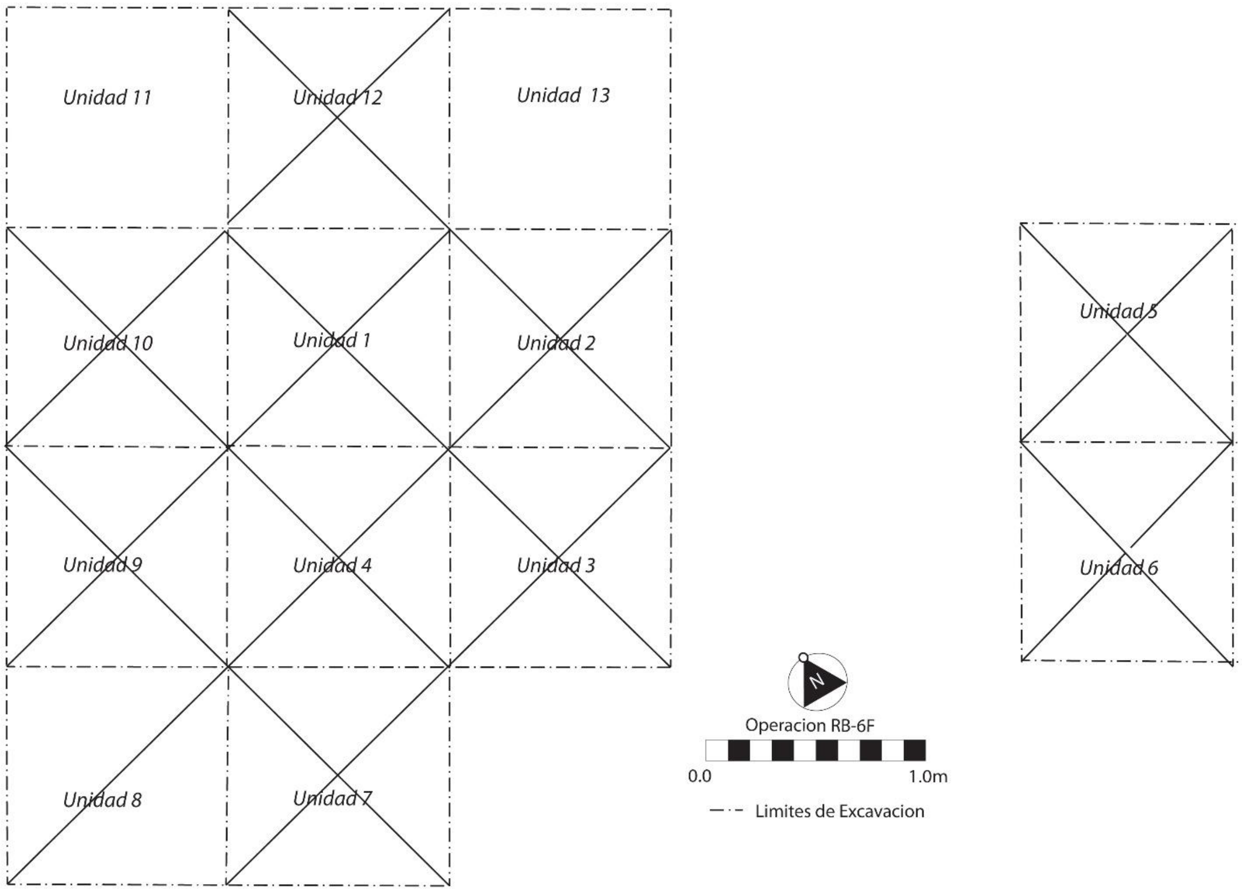


Figure A.29 Location of units in Operation 6F, with exes indicating which were excavated (Drawing by J. Dobereiner)

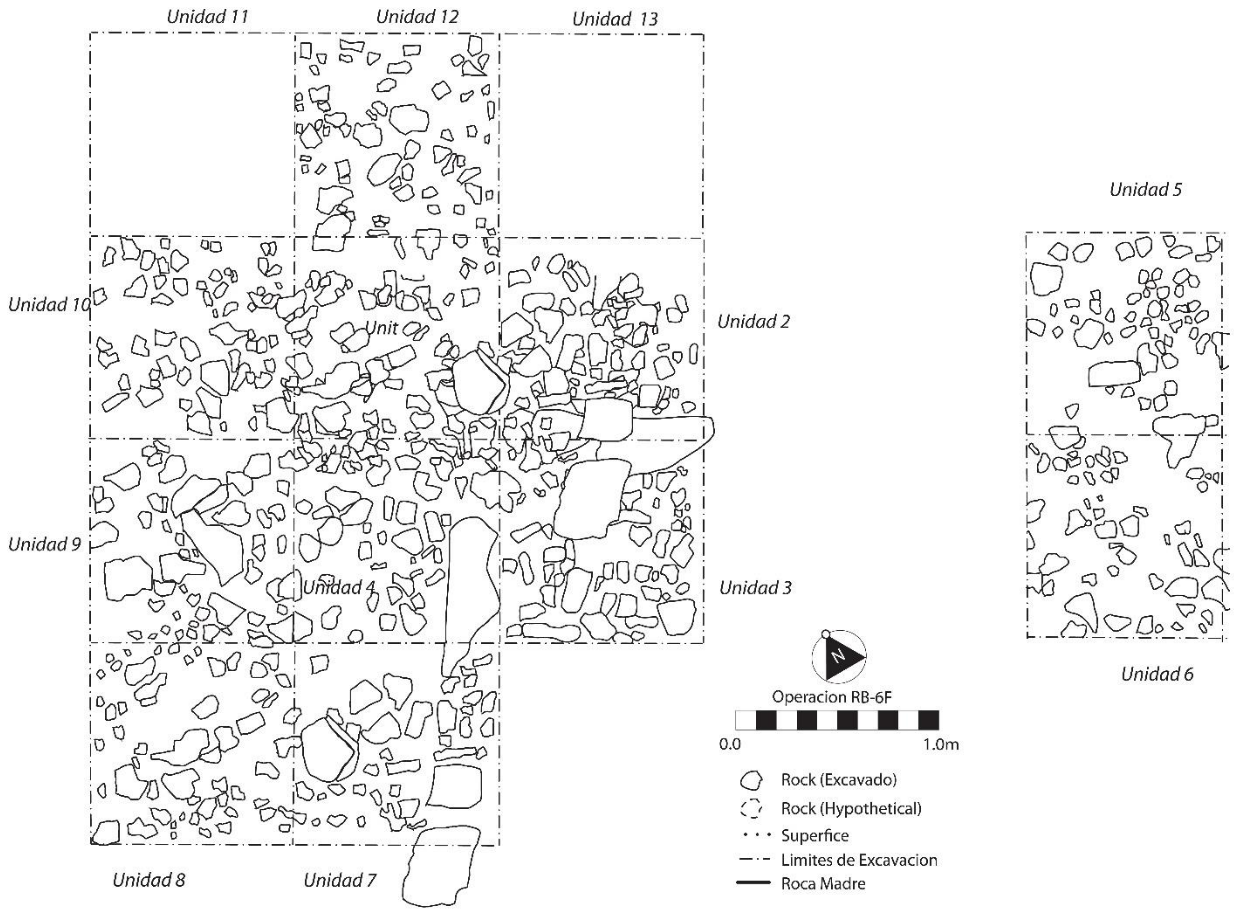


Figure A.30 Plan of excavated units in Operation 6F: 1-10 + 12 (Drawing by Y. Cabrera and J. Dobereiner).

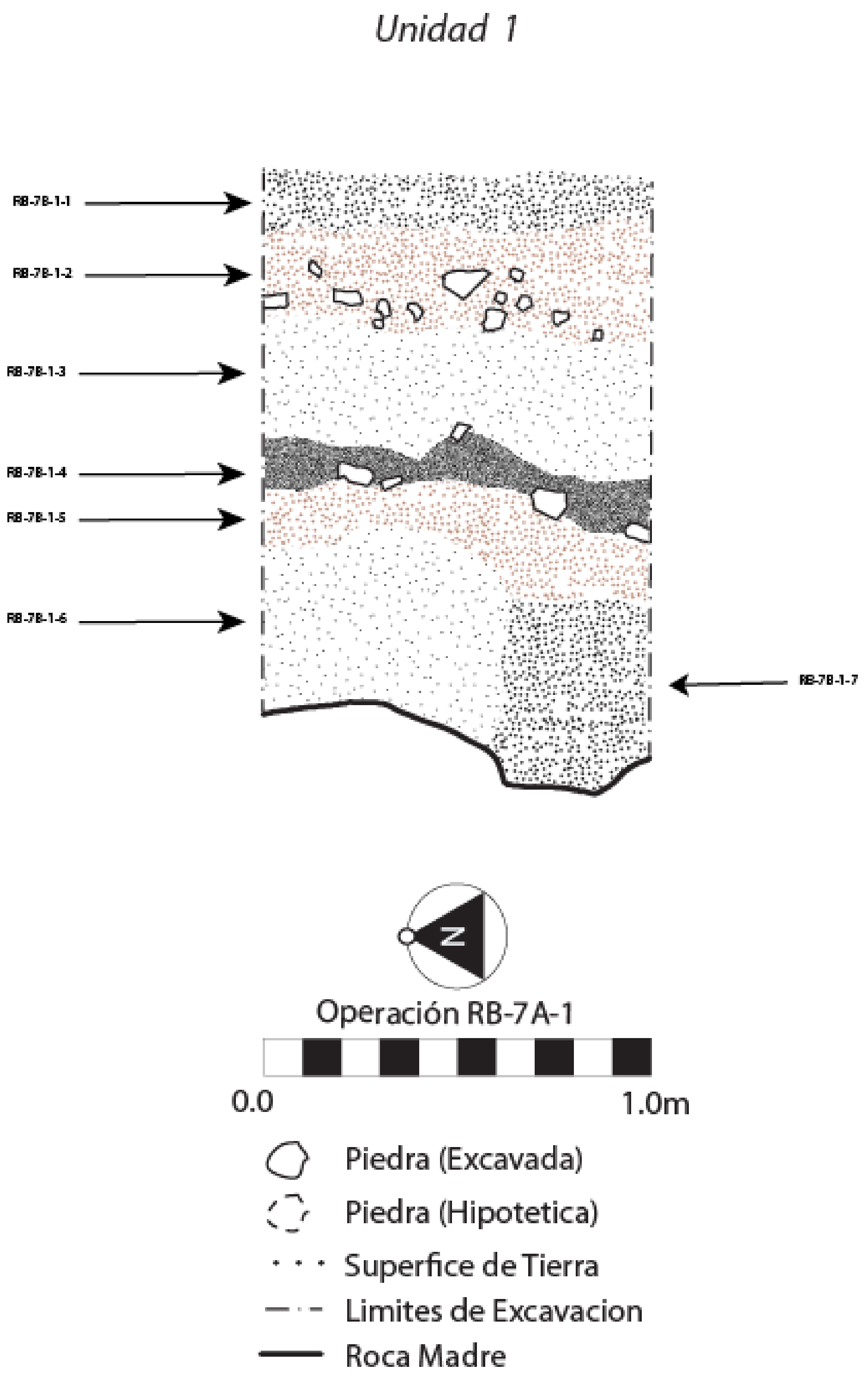


Figure A.31 Profile of unit RB-7A-1 (Drawing by J. Dobereiner).

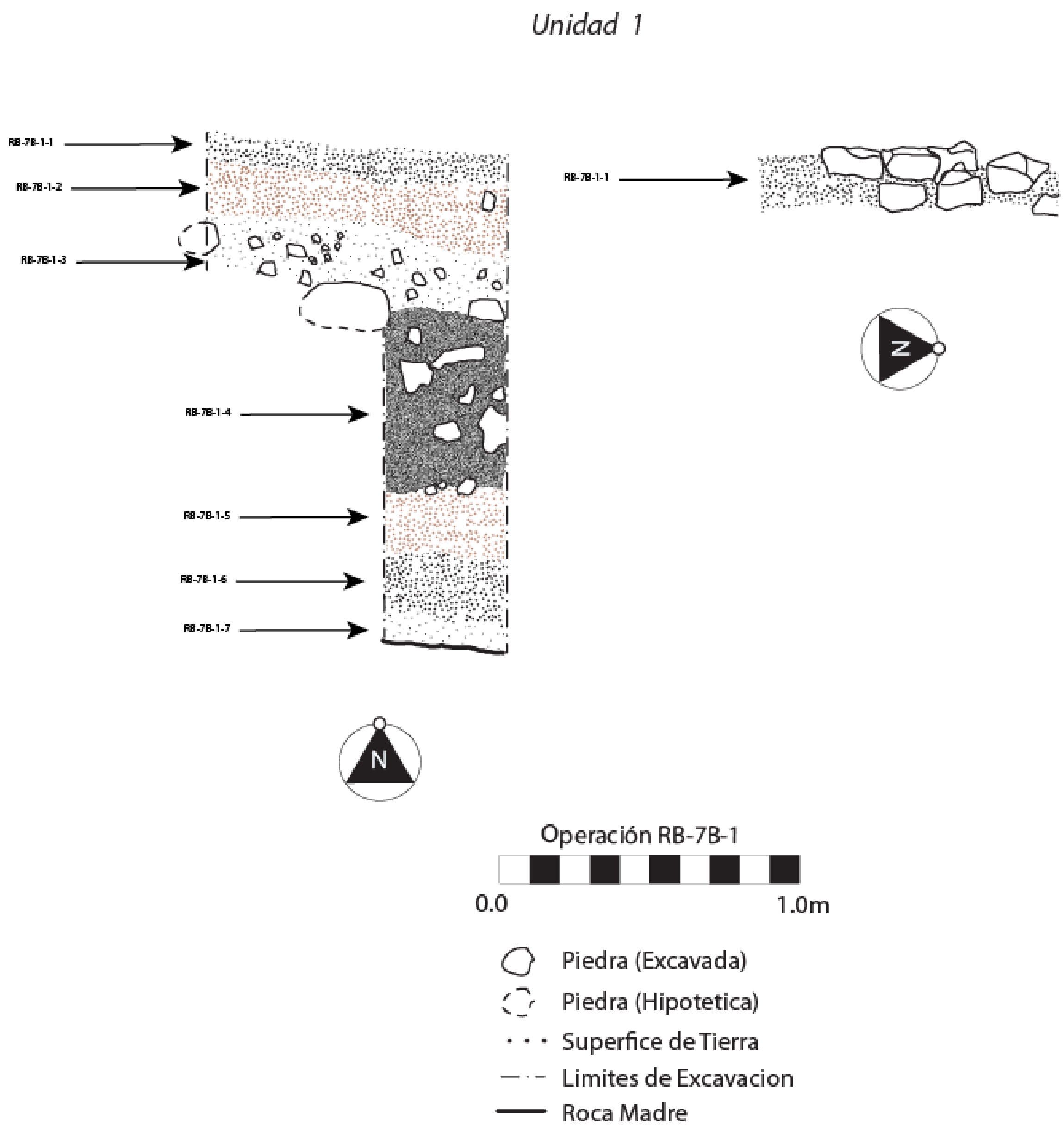


Figure A.32 Profiles of unit RB-7B-1-, including intact platform wall (Drawing by J. Dobereiner).

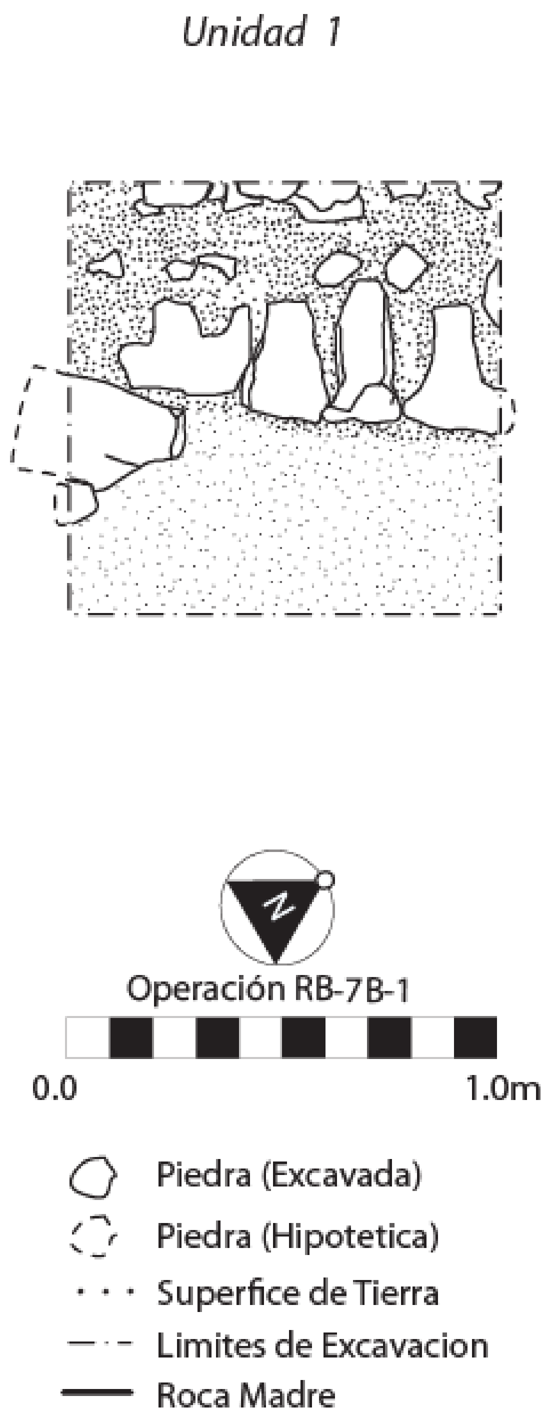


Figure A.33 Plan view of RB-7B-1, with intact wall (Drawing by J. Dobereiner).

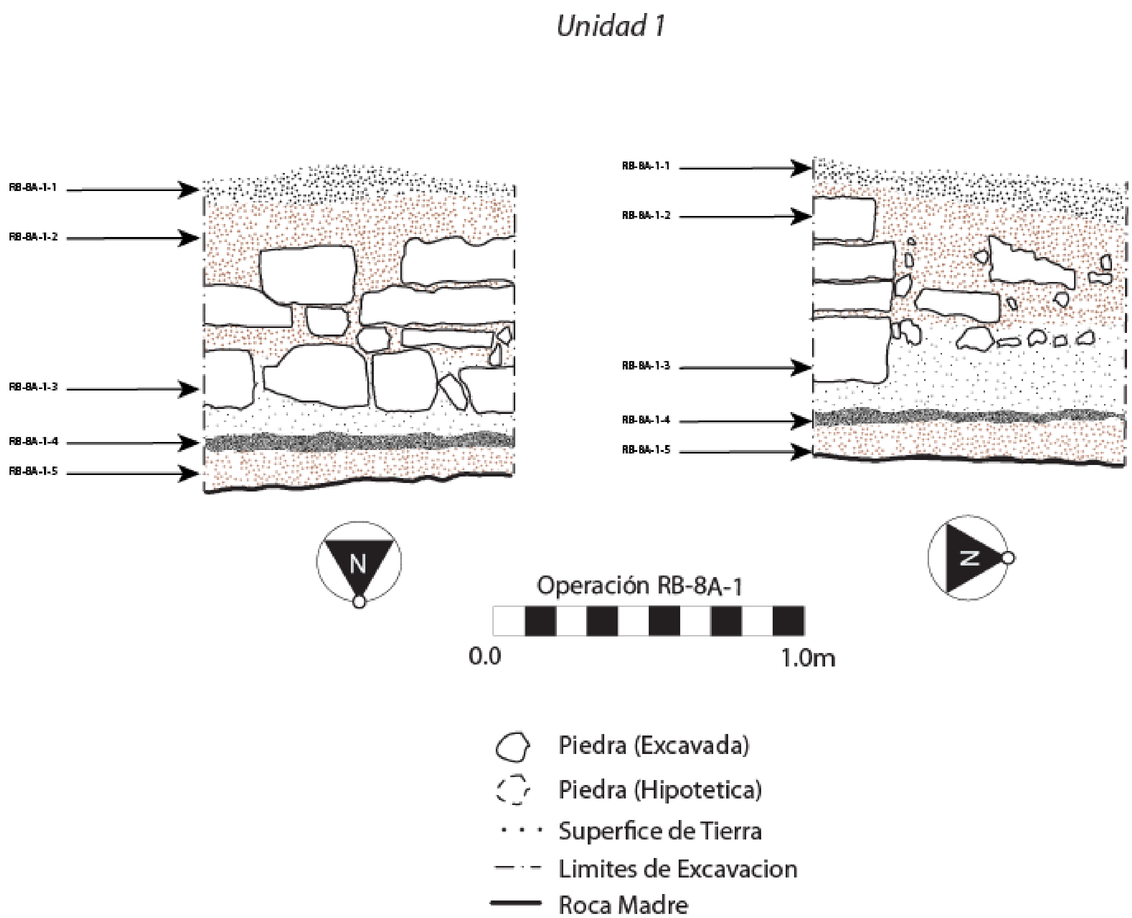


Figure A.34. Profiles of unit RB-8A-1-, including perspective of intact wall (Drawing by A. Delgado and J. Dobereiner).

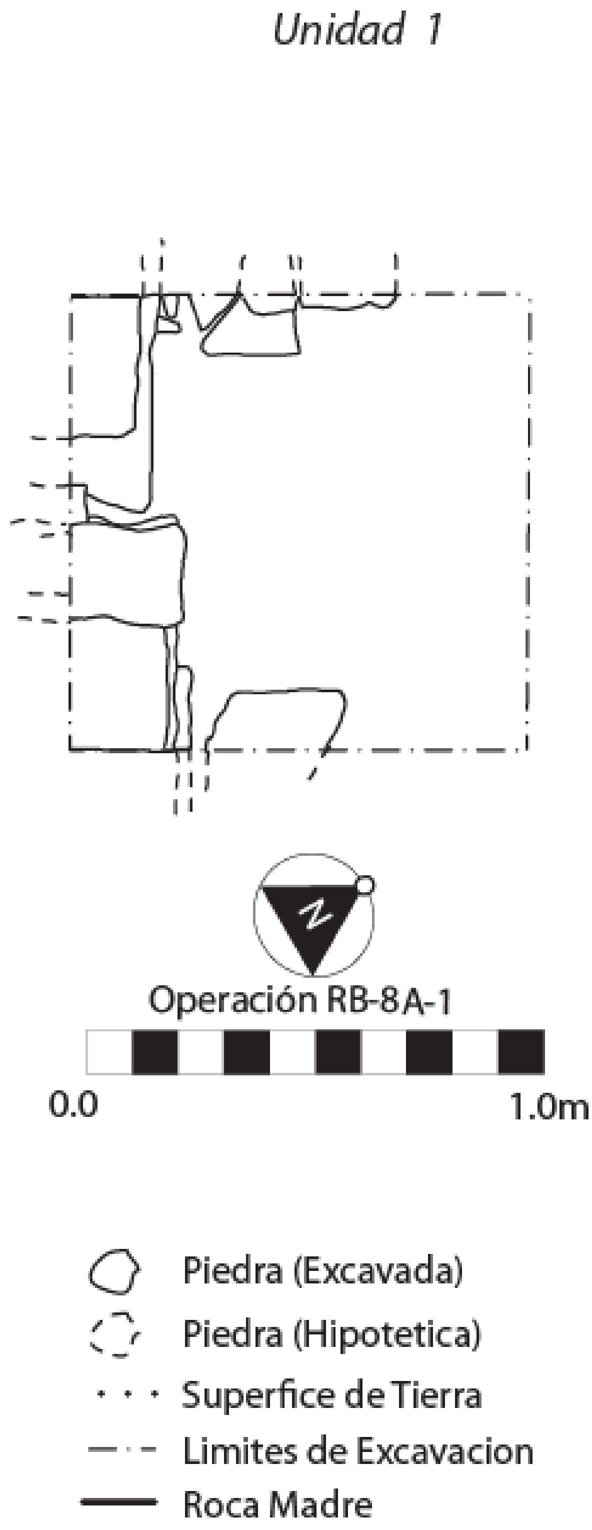


Figure A.35 Plan view of RB-8A-1, including intact platform wall (Drawing by A. Delgado and J. Dobereiner).

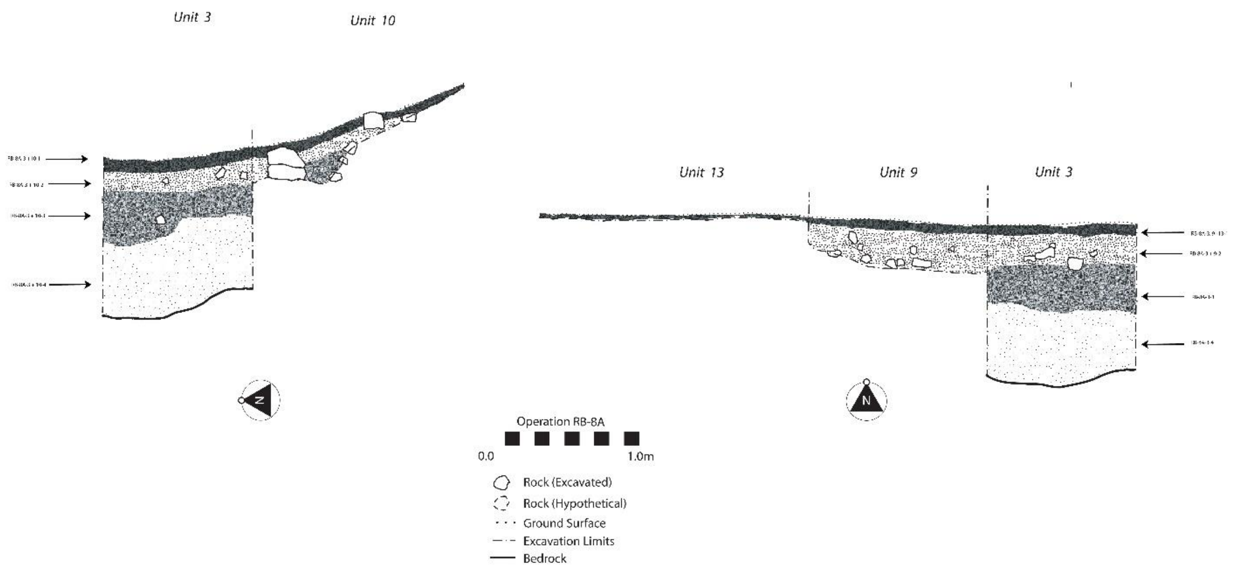


Figure A.36 Profile of RB-8A units 3, 9, 10 and 13 (Drawing by J. Dobereiner).

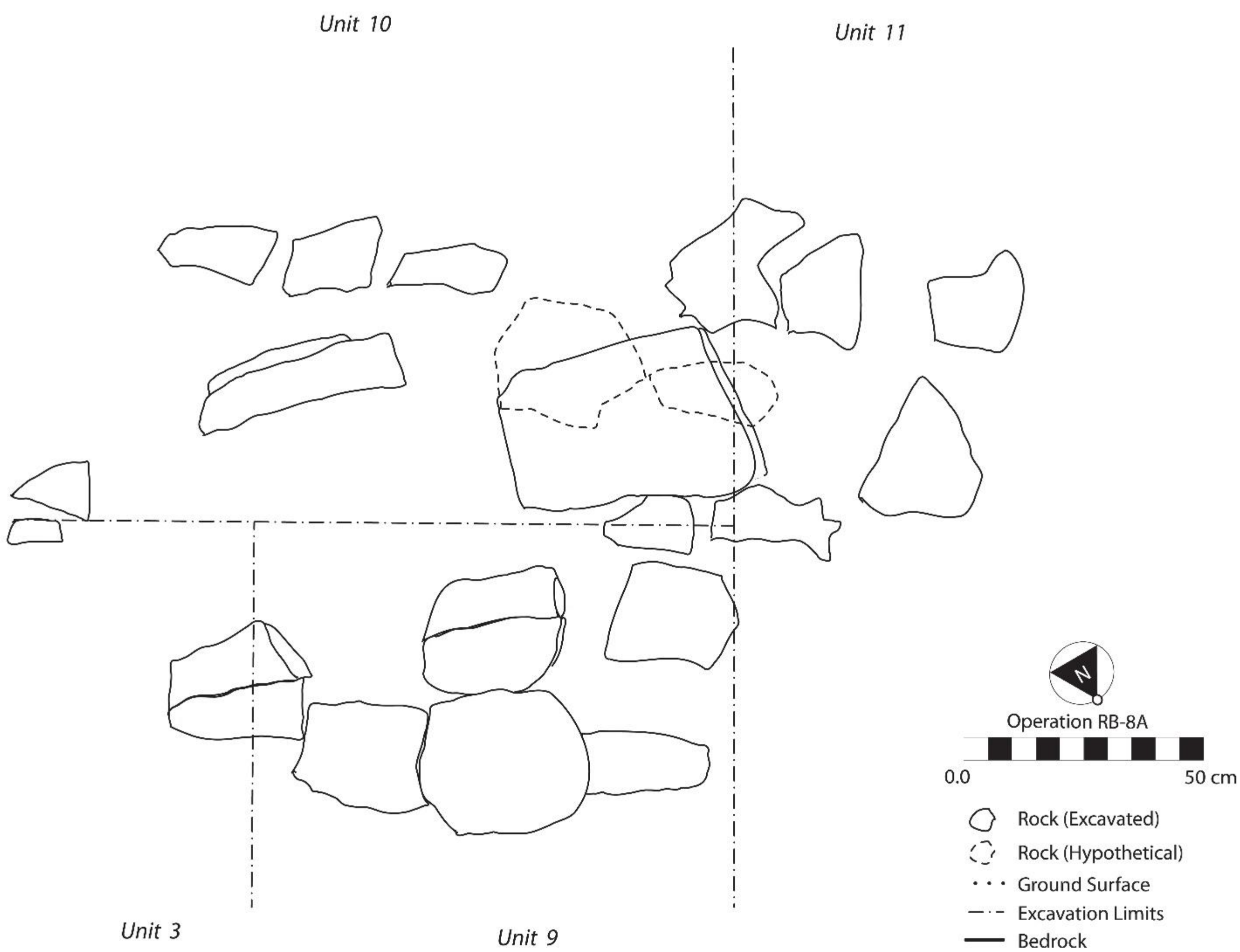


Figure A.37 Drawing of stones in plan view on top of burial 3 in RB-8A (Drawing by J. Dobereiner).

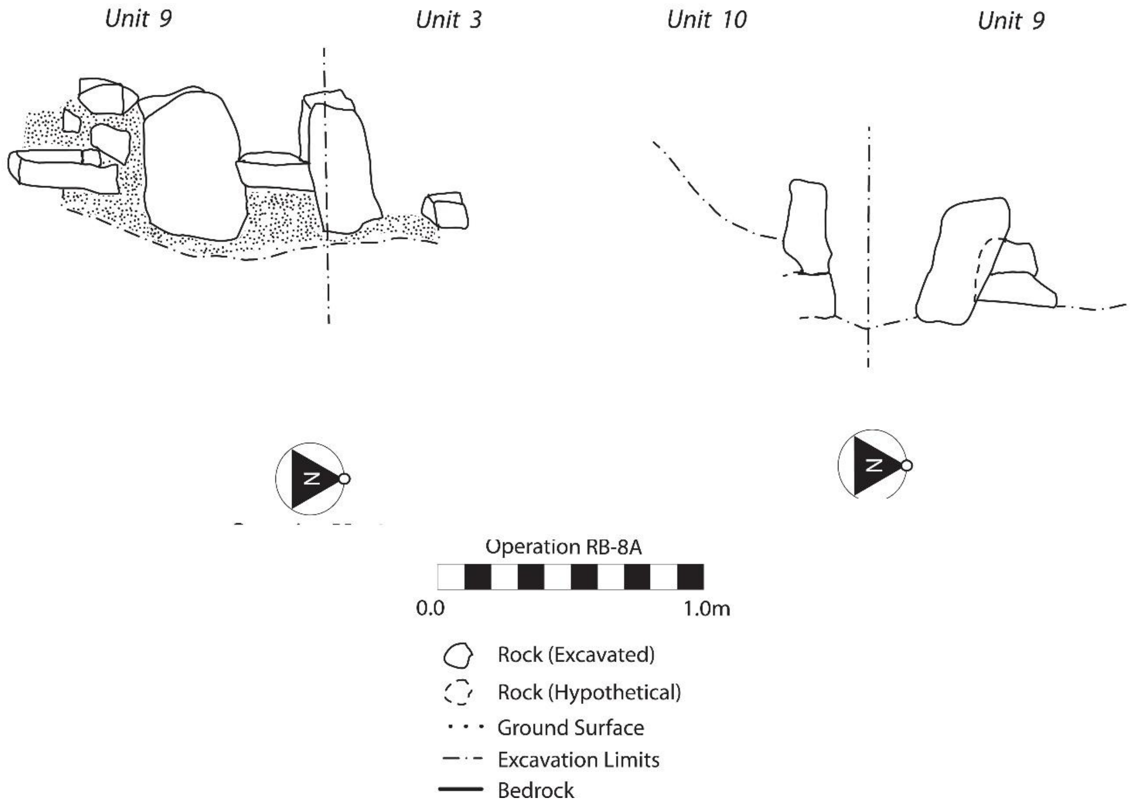


Figure A.38 Stone crypt surrounding burial 3 in RB-8A (Drawing by J. Dobereiner).

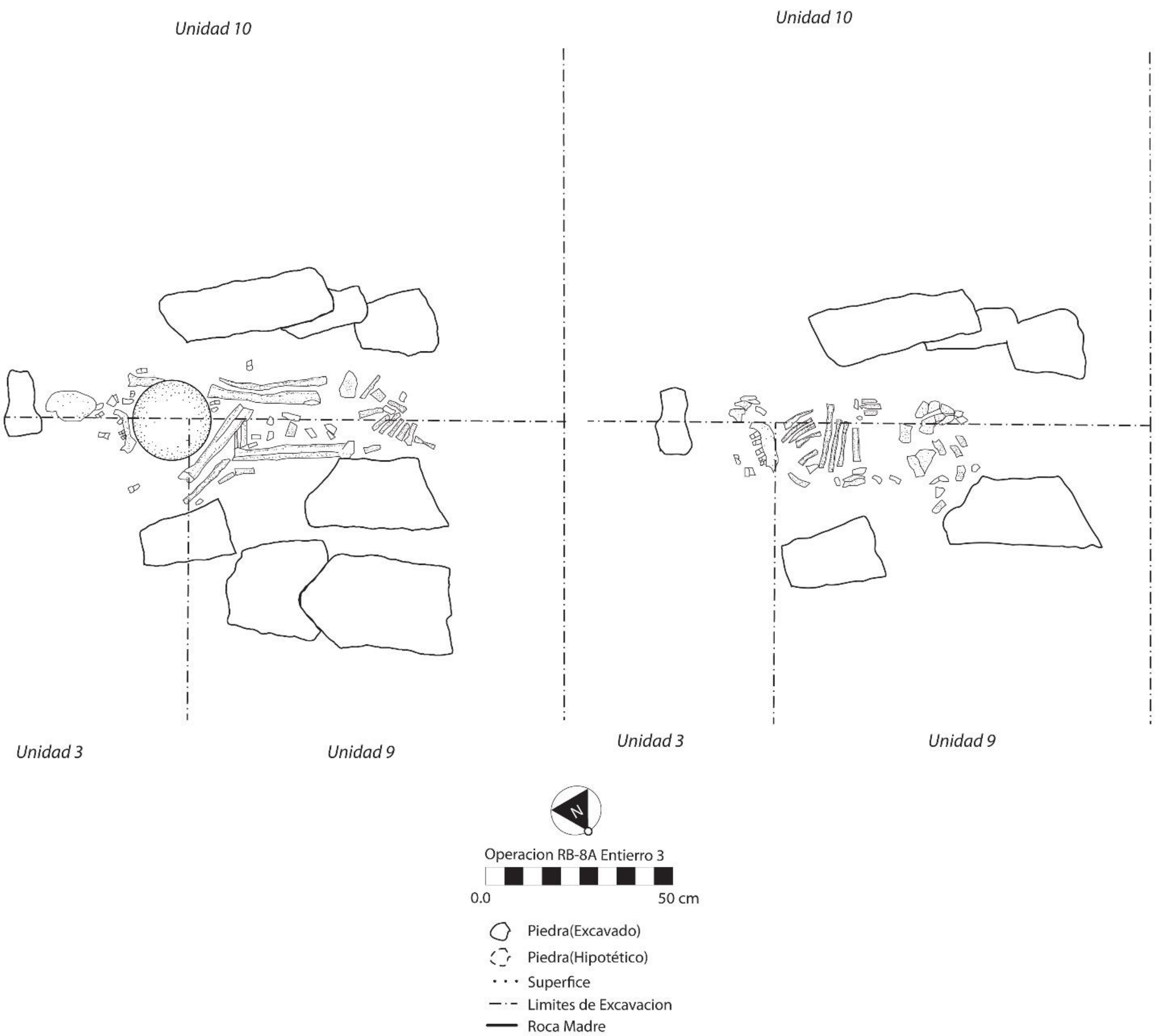


Figure A.39 Burial 3, phase one of excavation (left) and phase two of excavation (right) (Drawing by J. Dobereiner)

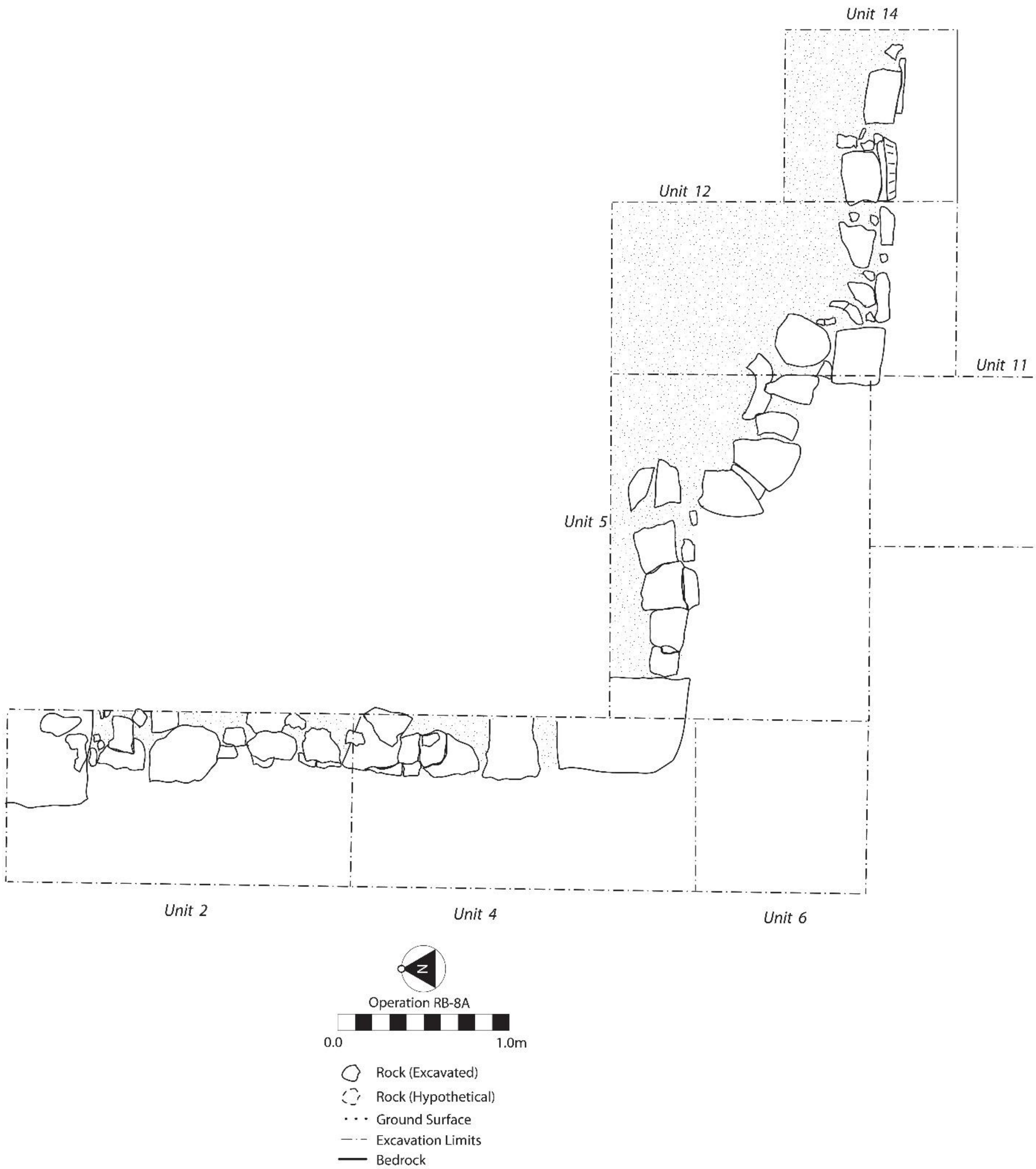


Figure A.40 Plan of the corner of structure D6-3, units RB-8A-2, 4, 5, 6, 11, 12, 14 (Drawing by J. Dobereiner).

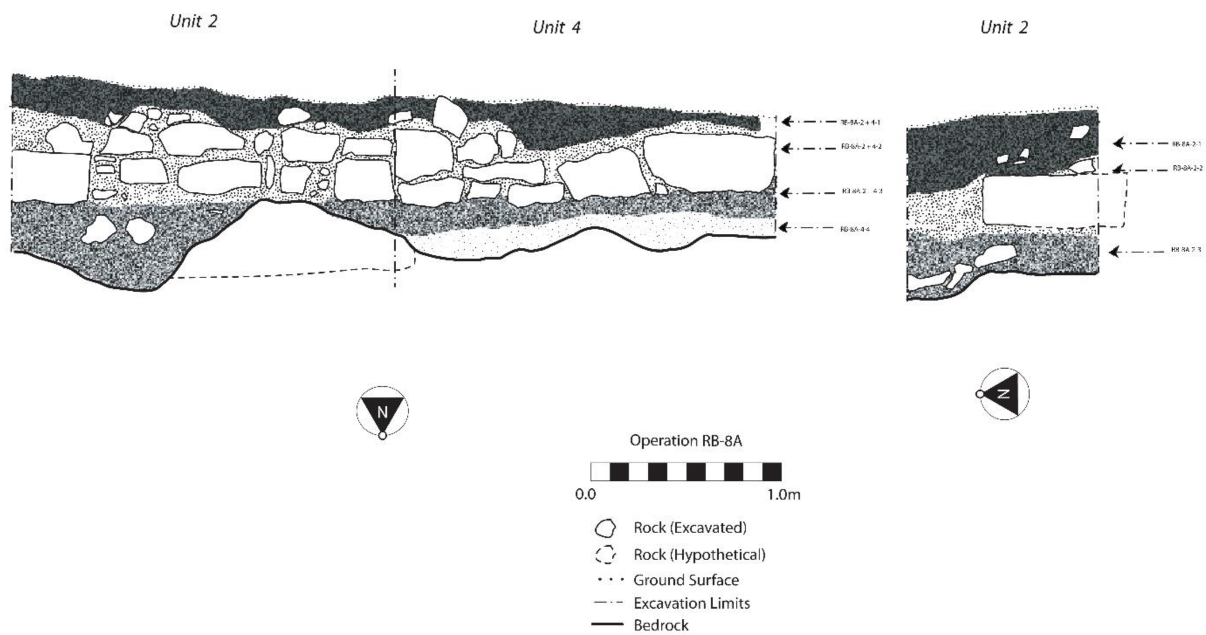


Figure A.41 Unit profile of RB-8A-2 and 4 (Drawing by O. Molina and J. Dobereiner).

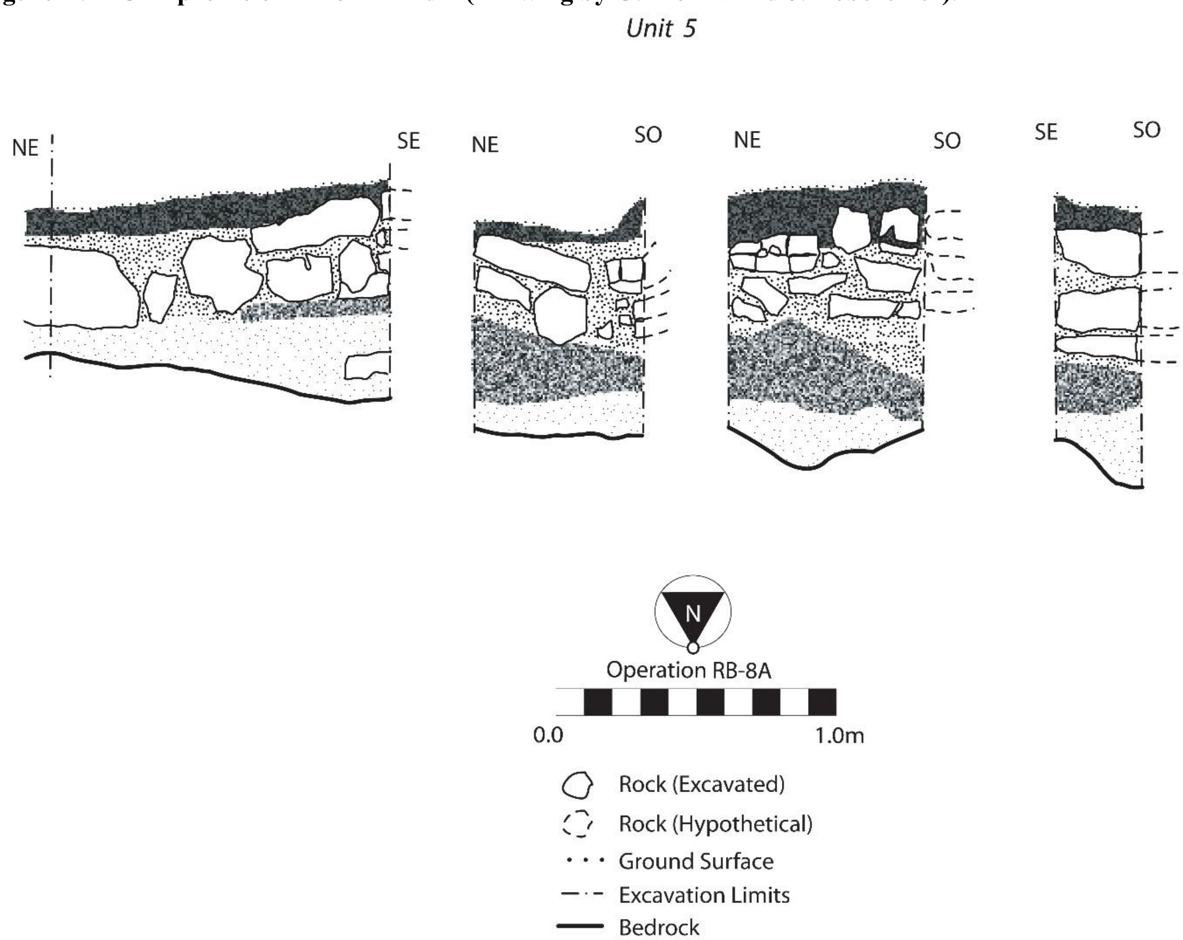


Figure A.42 Unit profile of RB-8A-5 (Drawing by O. Molina and J. Dobereiner).

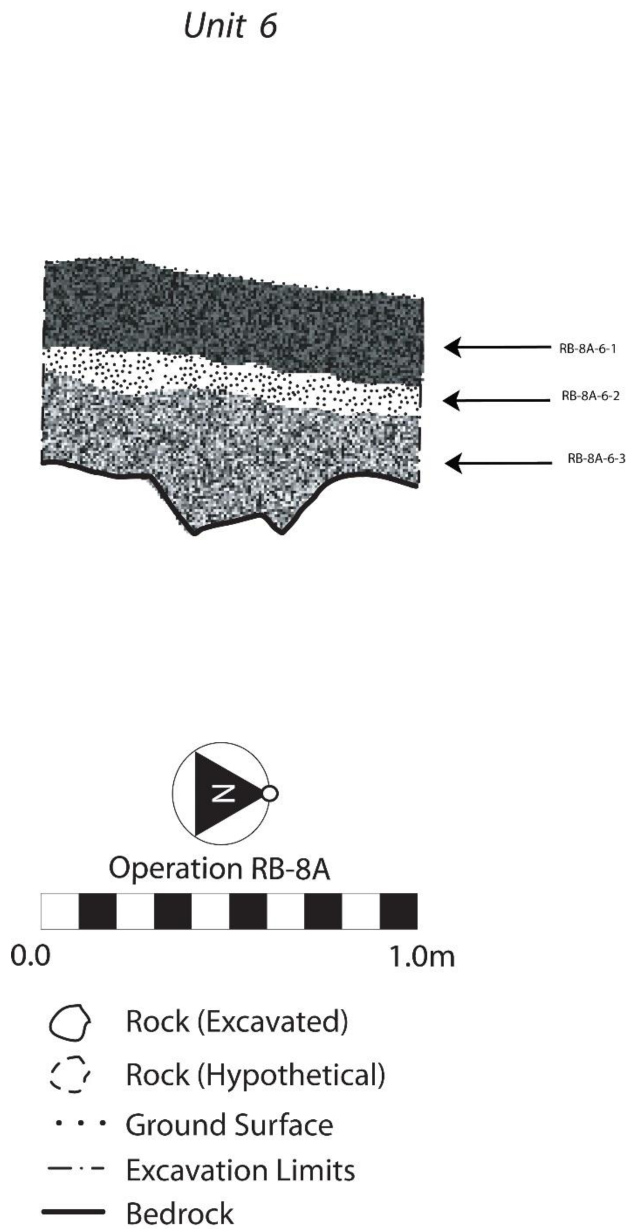


Figure A.43 Unit profile of RB-8A-6 (Drawing by O. Molina and J. Dobereiner).

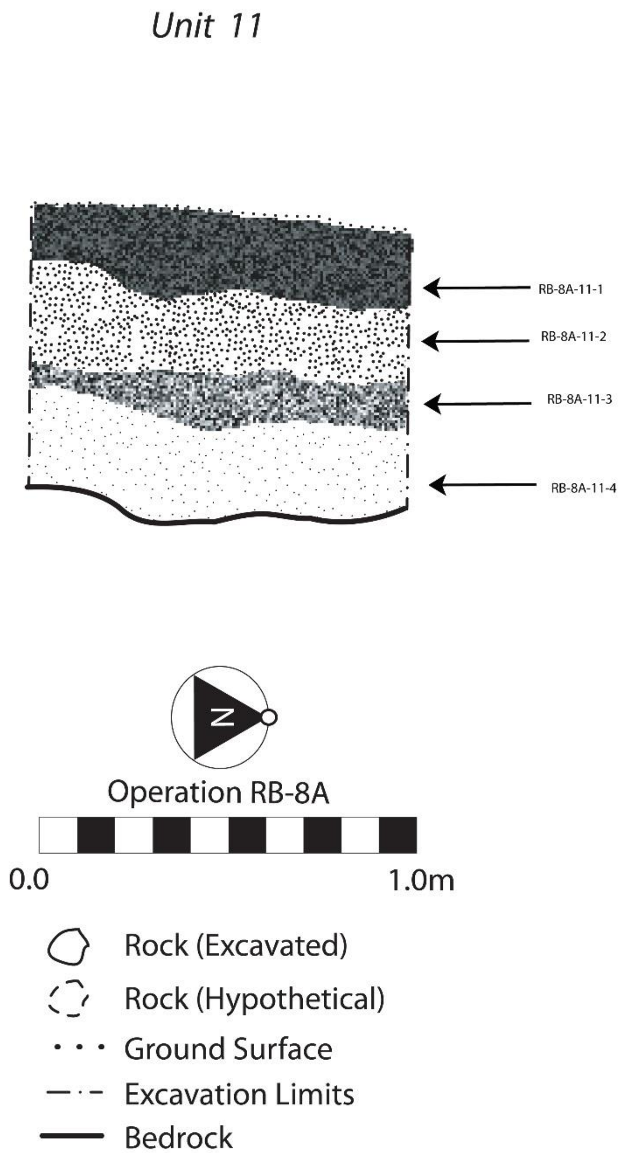


Figure A.44 Unit profile of RB-8A-11 (Drawing by O. Molina and J. Dobereiner).

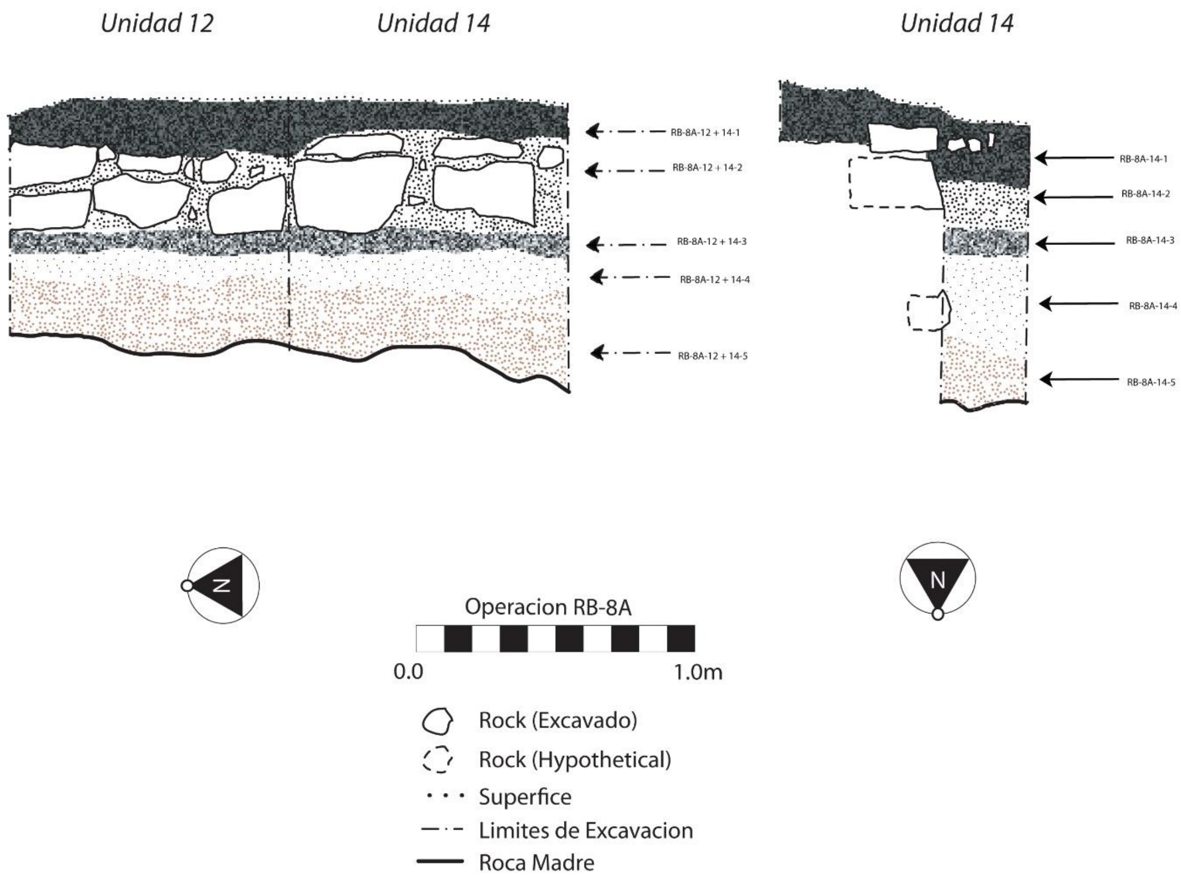


Figure A.45 Unit profile of RB-8A-12 and 14 (Drawing by O. Molina and J. Dobereiner).

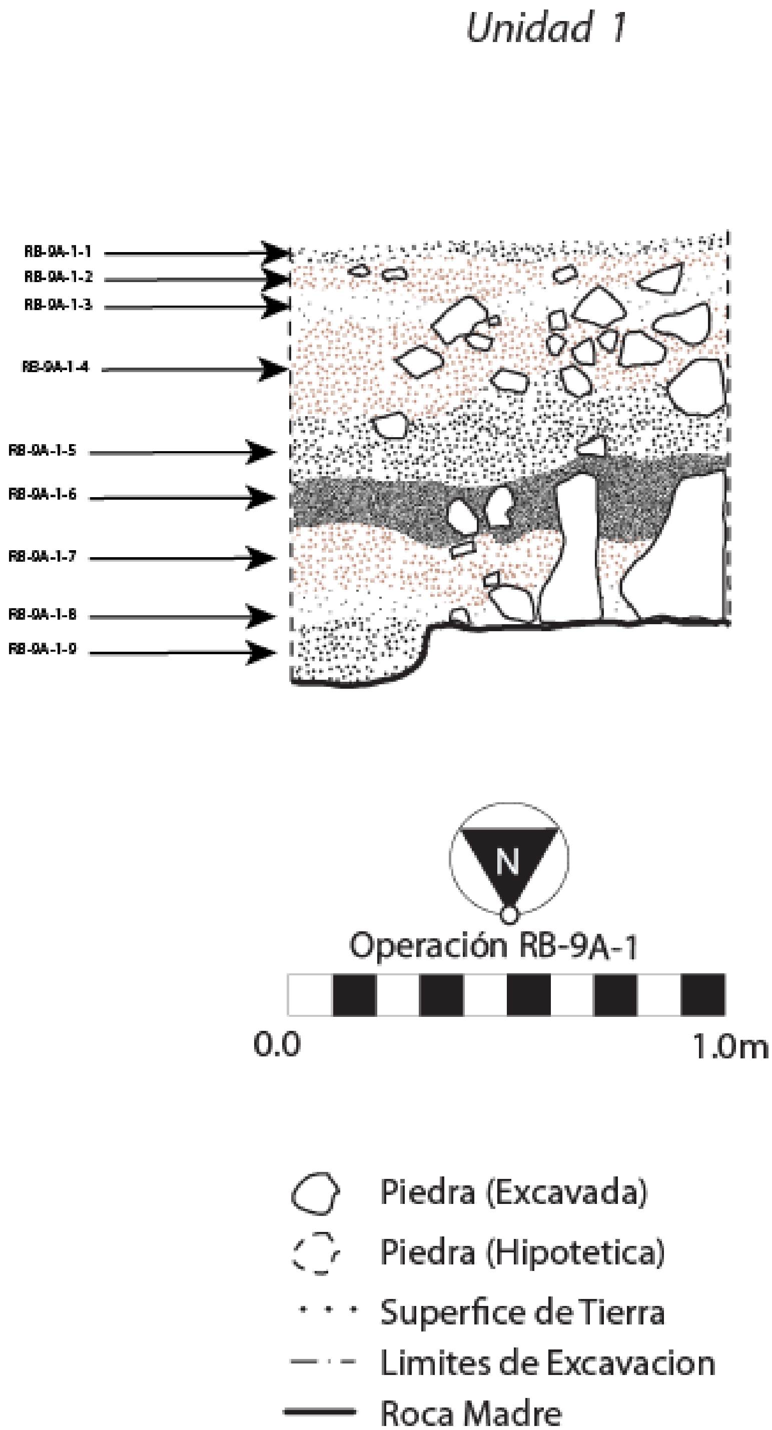


Figure A.46 Profile of unit RB-9A-1 (Drawing by A. Méndez Cab and J. Dobereiner).

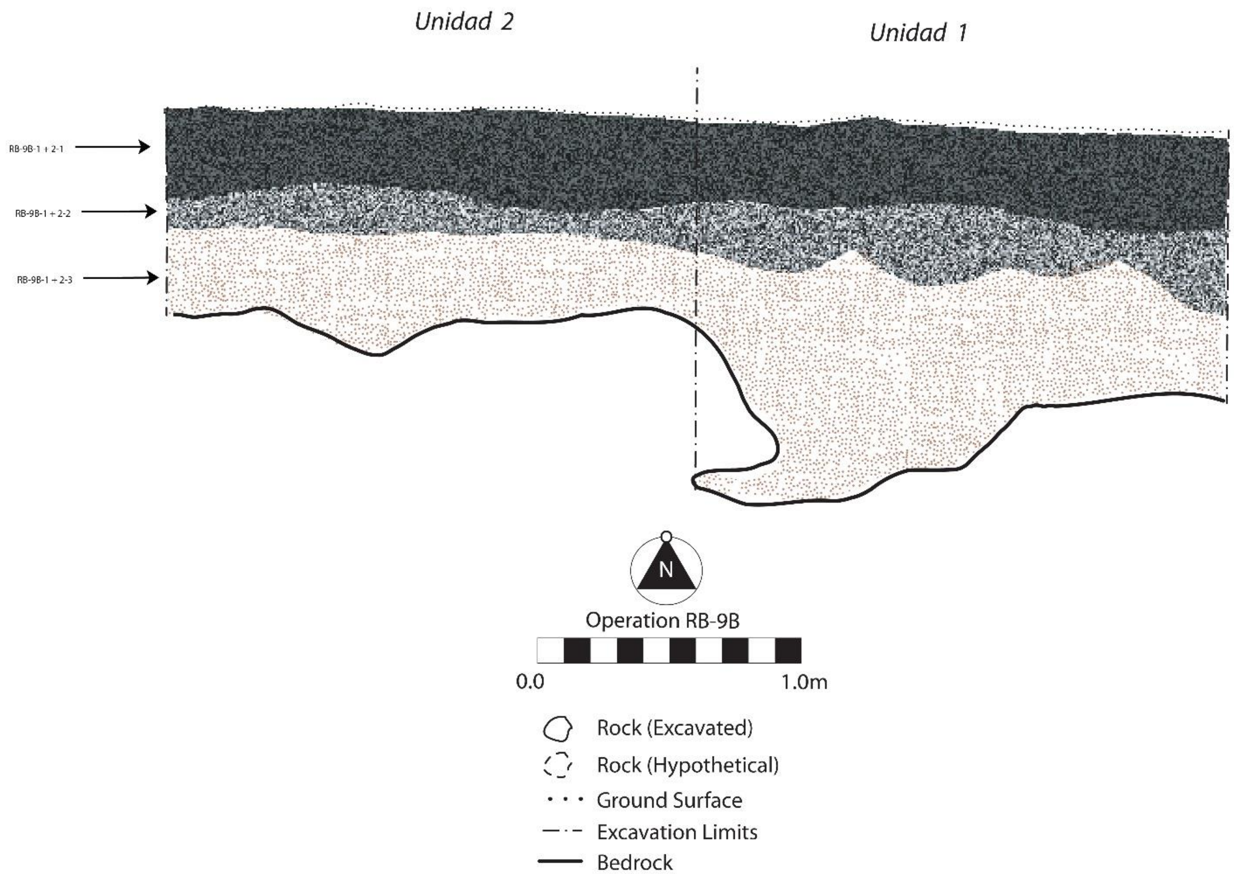


Figure A.47 Unit profile of RB-9B-1 and 2 (Drawing by Y. Cabrera and J. Dobereiner).

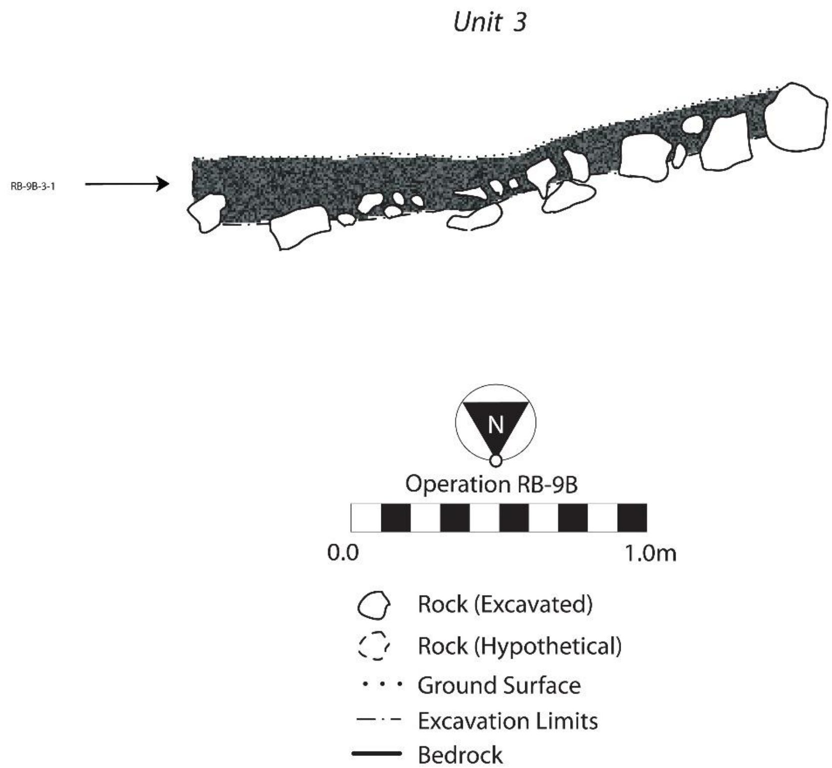


Figure A.48 Unit profile of RB-9B-3 (Drawing by Y. Cabrera and J. Dobereiner).

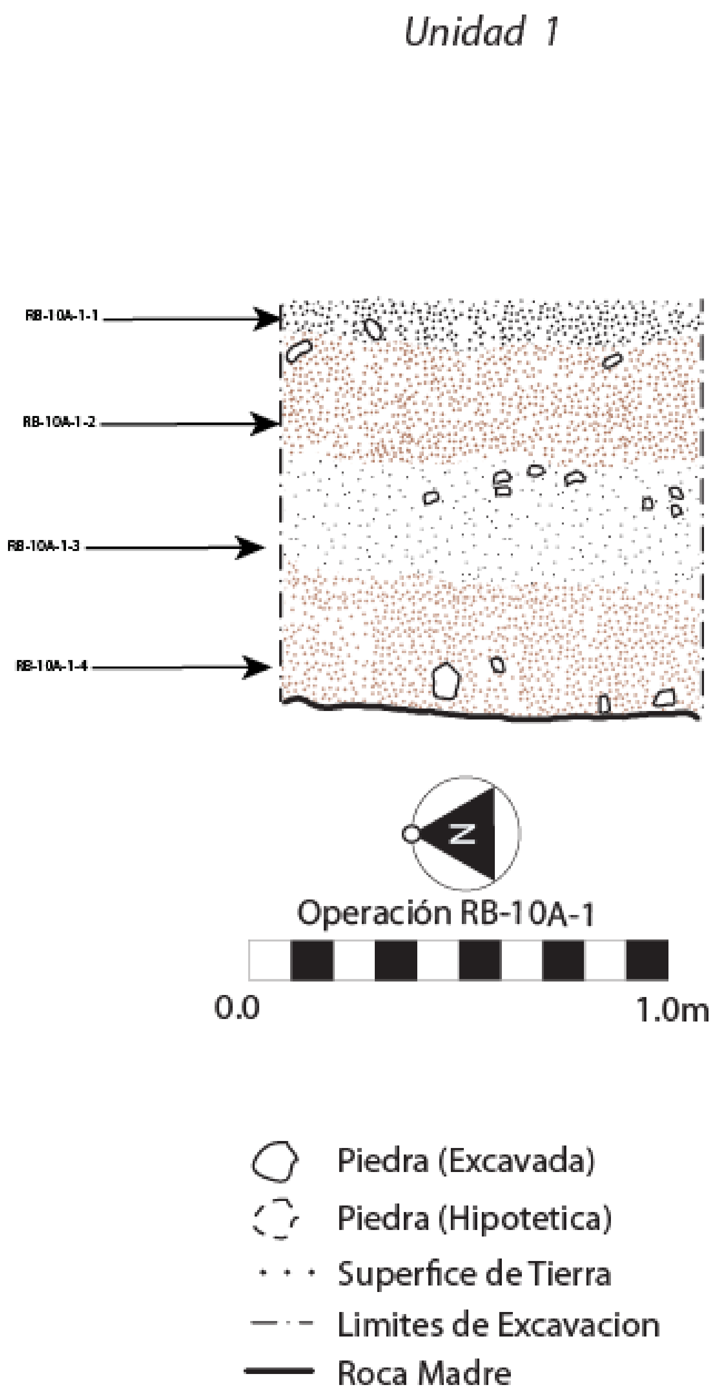


Figure A.49 Profile of unit RB-10A-1 (Drawing by A. Méndez Cab and J. Dobereiner).

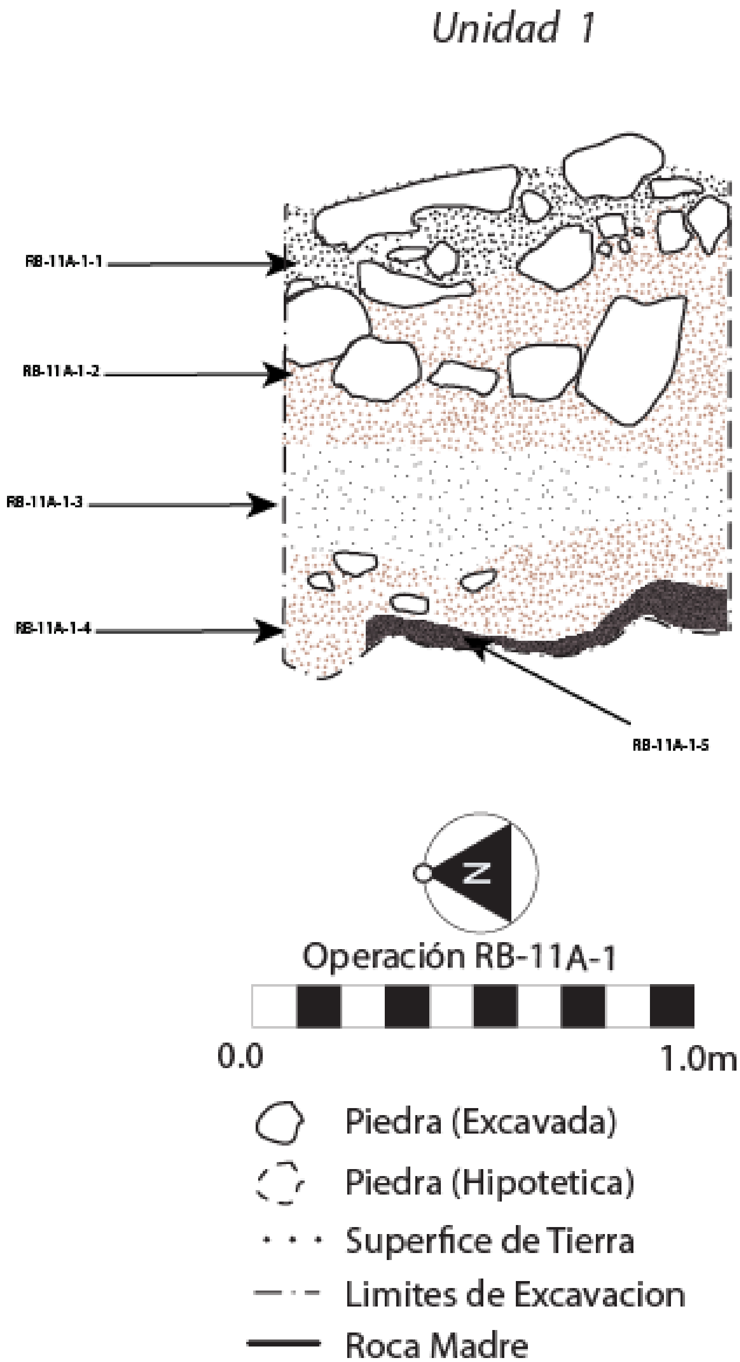


Figure A.50 Profile of unit RB-11A-1 (Drawing by A. Delgado and J. Dobereiner).

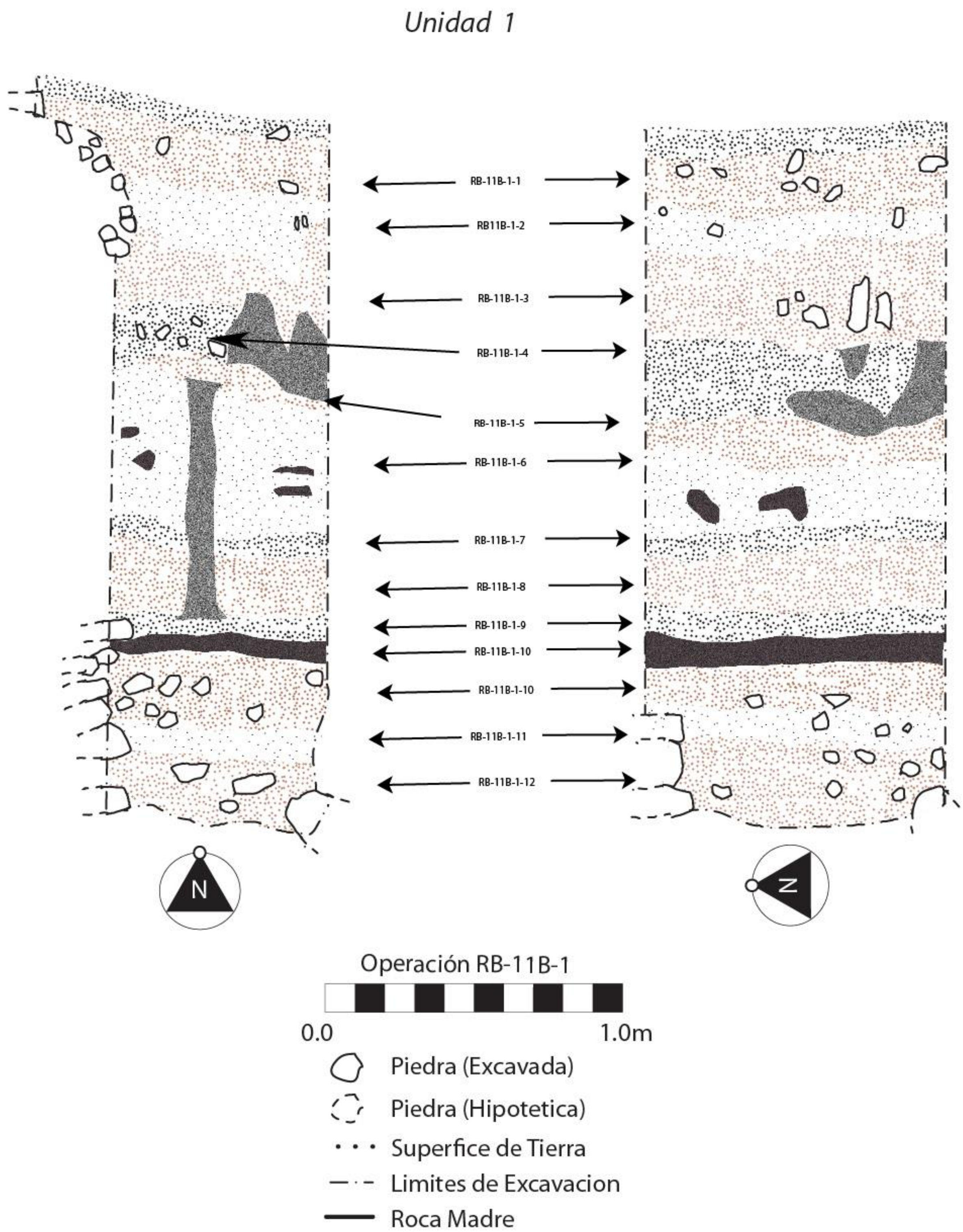


Figure A.51 Profiles of unit RB-11B-1, with layers of diversely colored anthropogenic soil fill (Drawing by J. Dobereiner).


Figure A.52 Looting destruction of structure E6-4 (photo by J. Dobereiner)

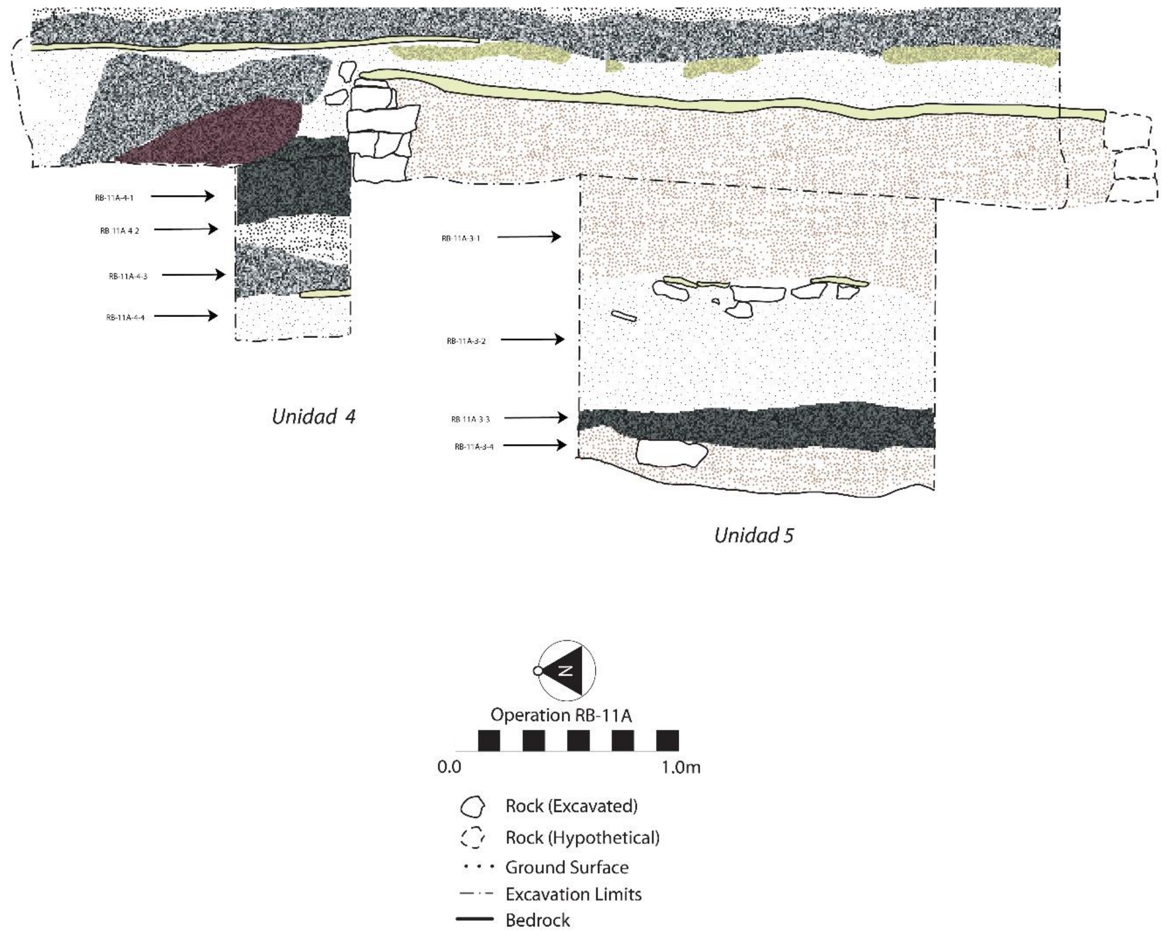


Figure A.53 Unit profile of RB-11A-2, 4 and 5 (Drawing by J. Dobereiner and O. Molina)

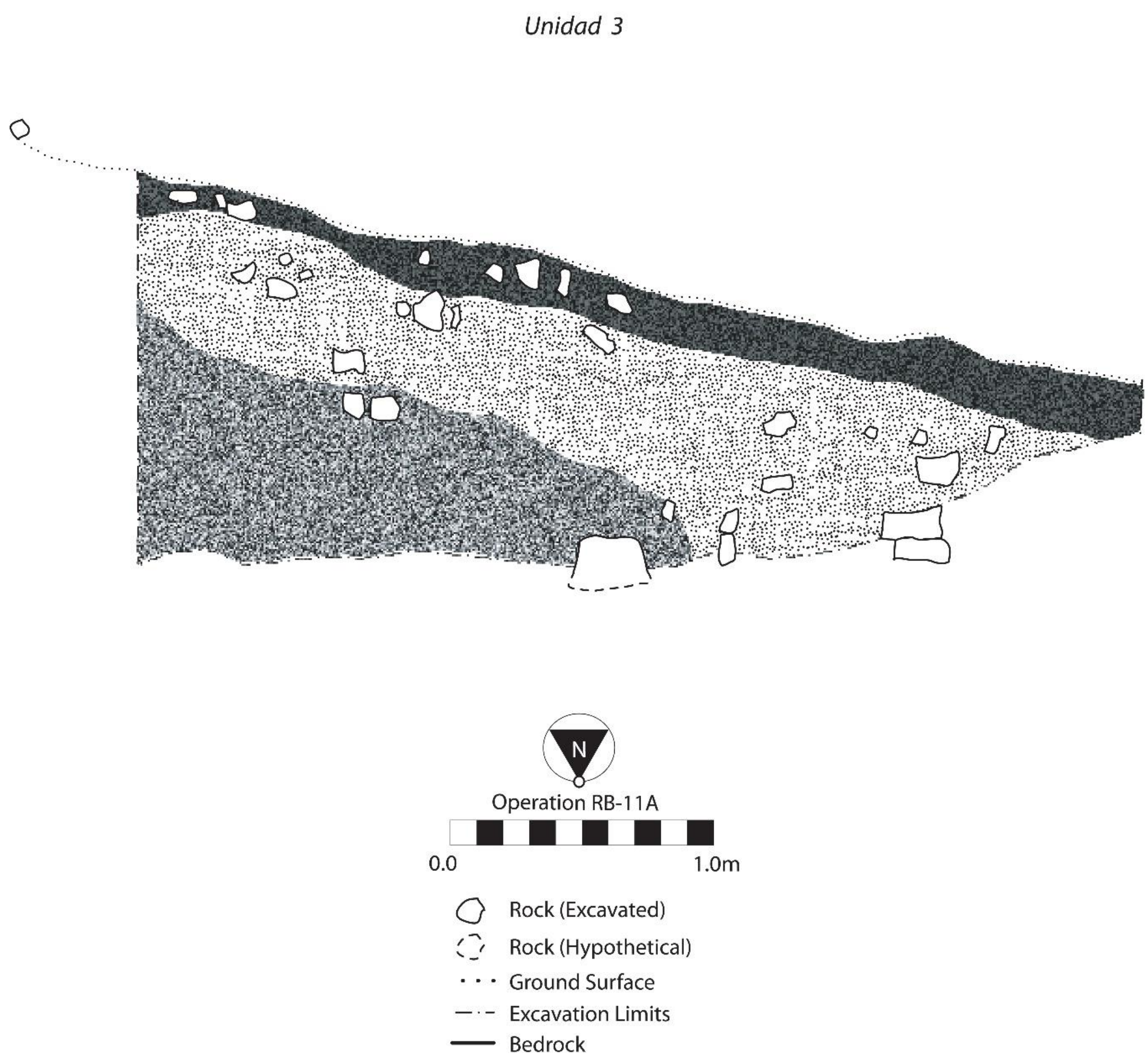


Figure A.54 Unit profile of RB-11A-3 (Drawing by J. Dobereiner).

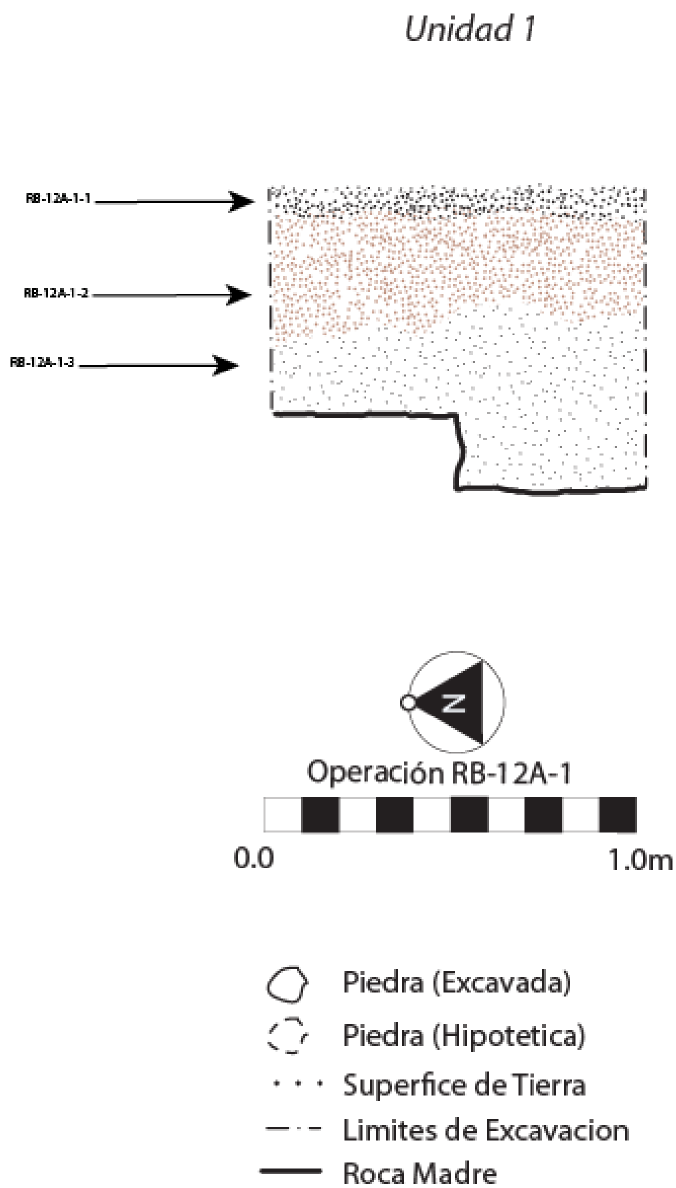


Figure A.55 Profile of unit RB-12A-1 (Drawing by A. Delgado and J. Dobereiner).

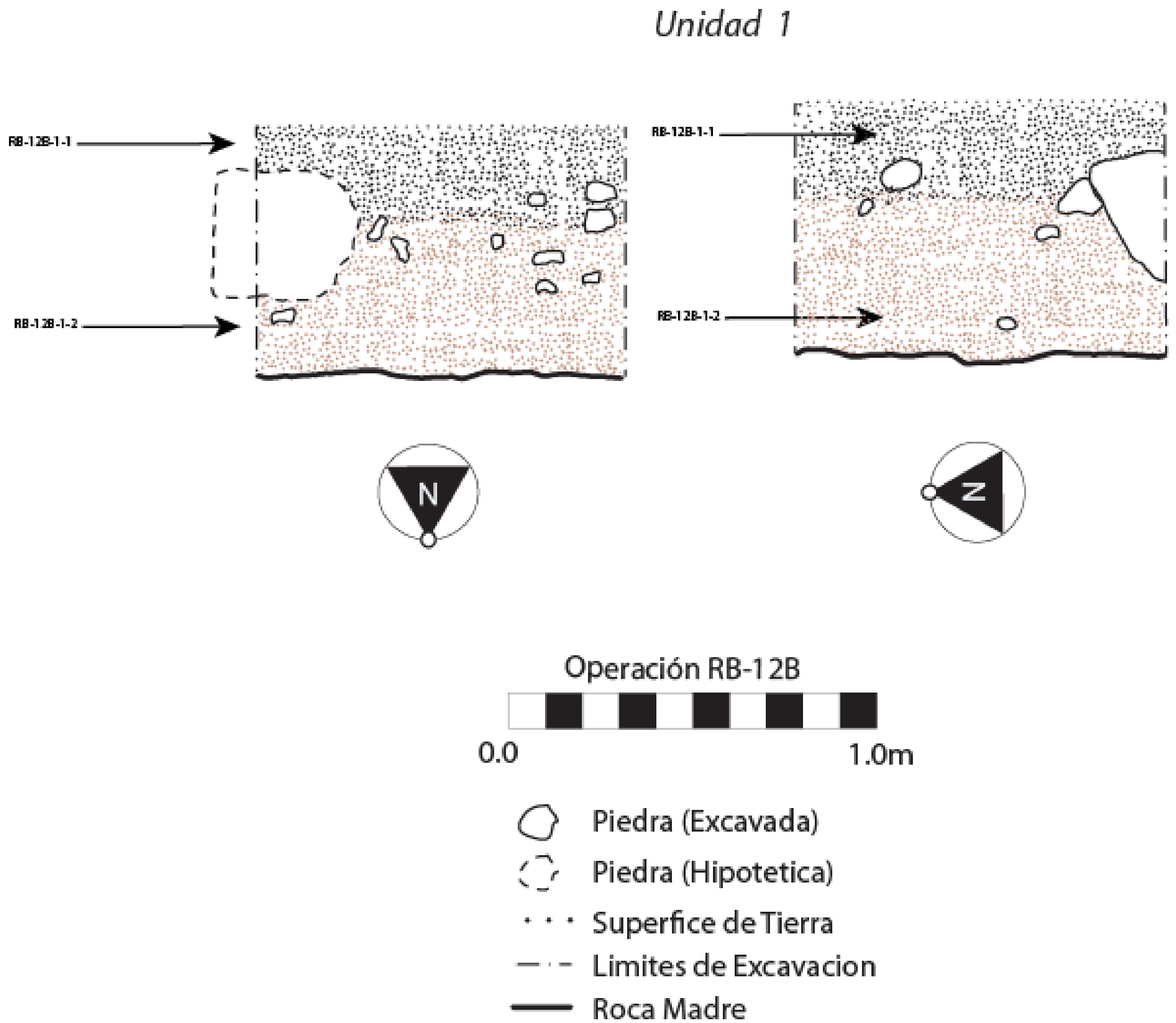


Figure A.56 Profile of unit RB-12B-1 (Drawing by A. Delgado and J. Dobereiner).

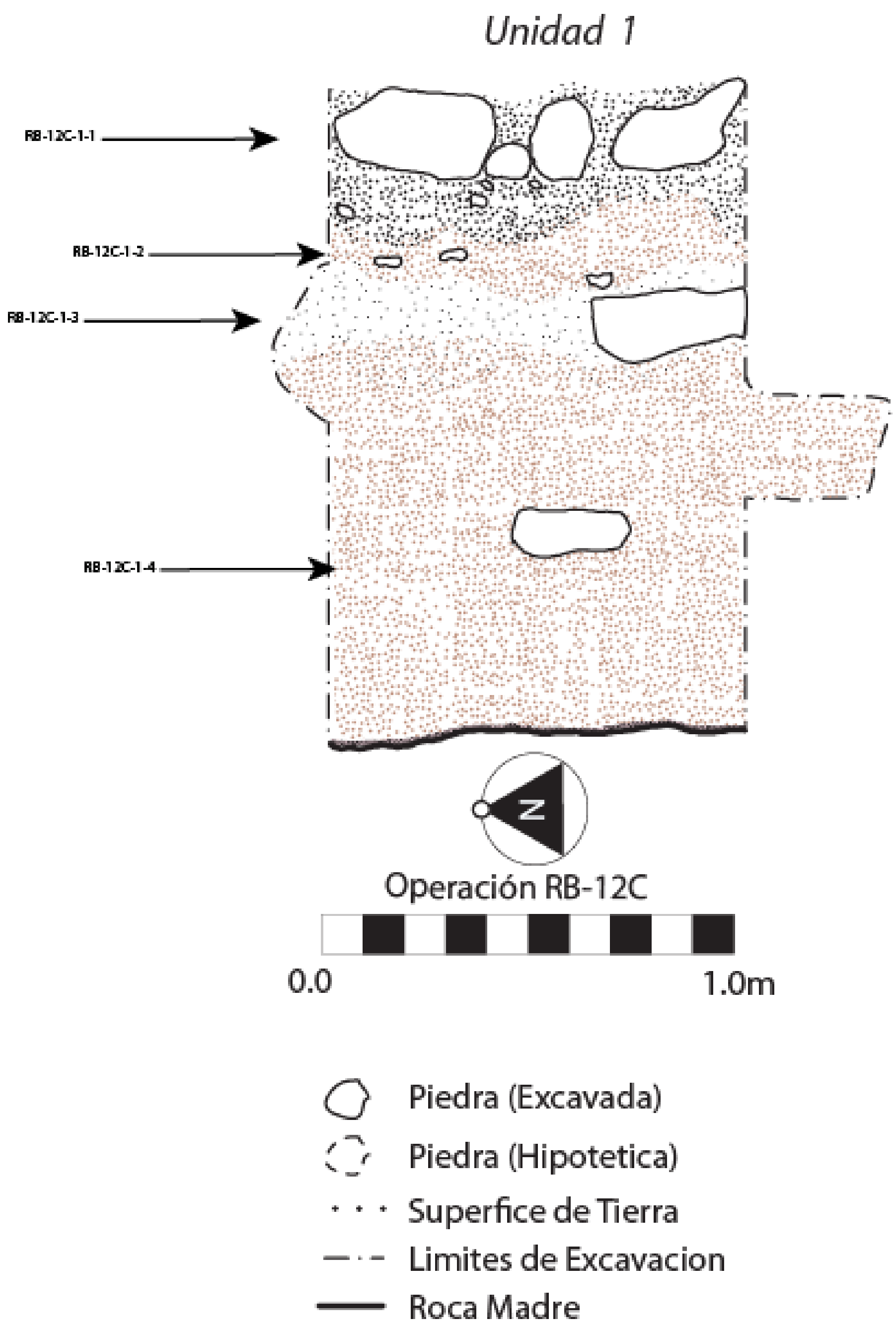


Figure A.57 Profile of unit RB-12C-1 (Drawing by A. Delgado and J. Dobereiner).

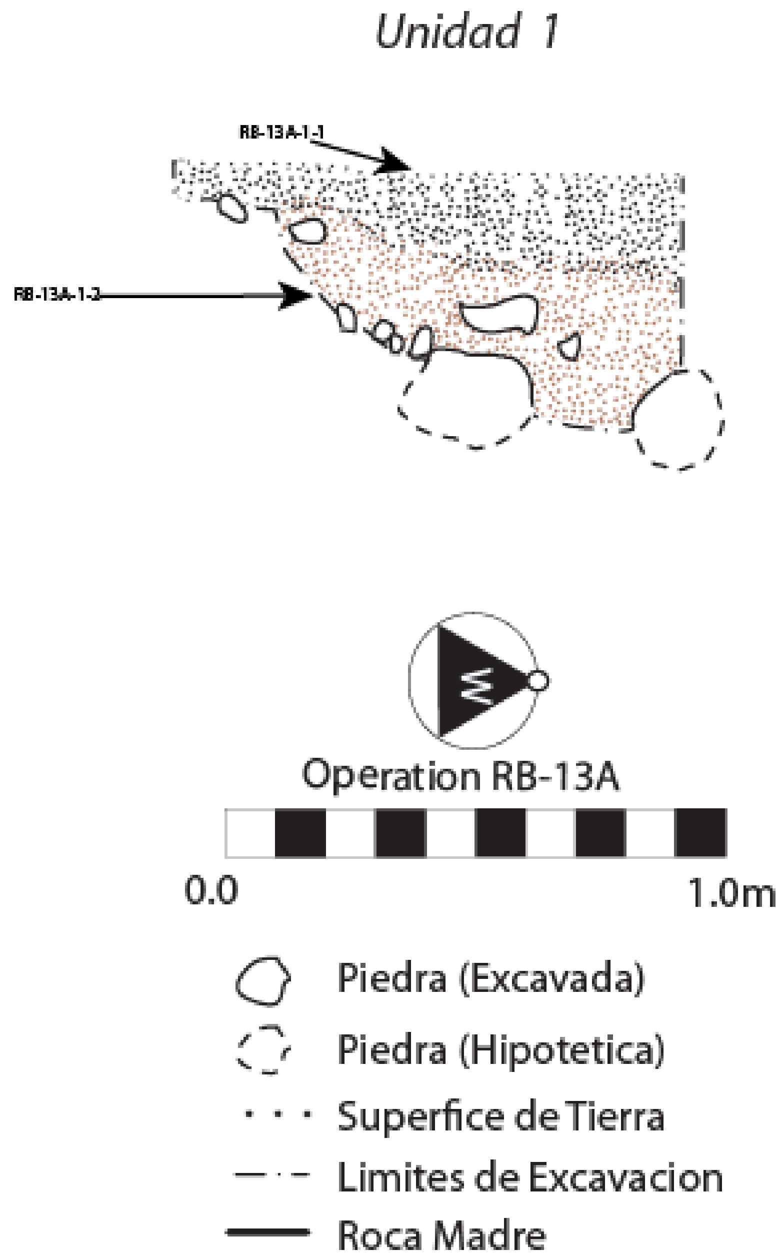


Figure A.58 Profile of unit RB-13A-1 (Drawing by J. Dobereiner).

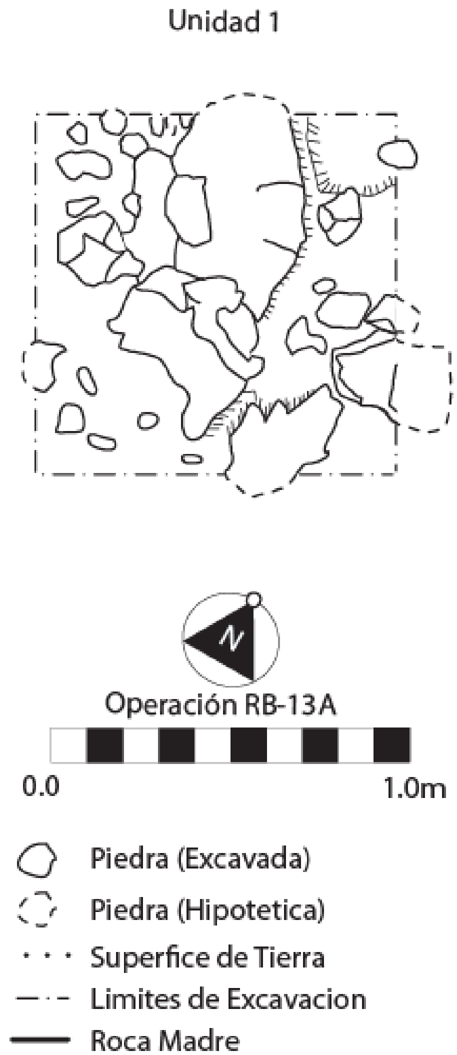


Figure A.59 Plan of RB-13A-1, showing possible hewn bedrock steps (Drawing by J. Dobereiner).

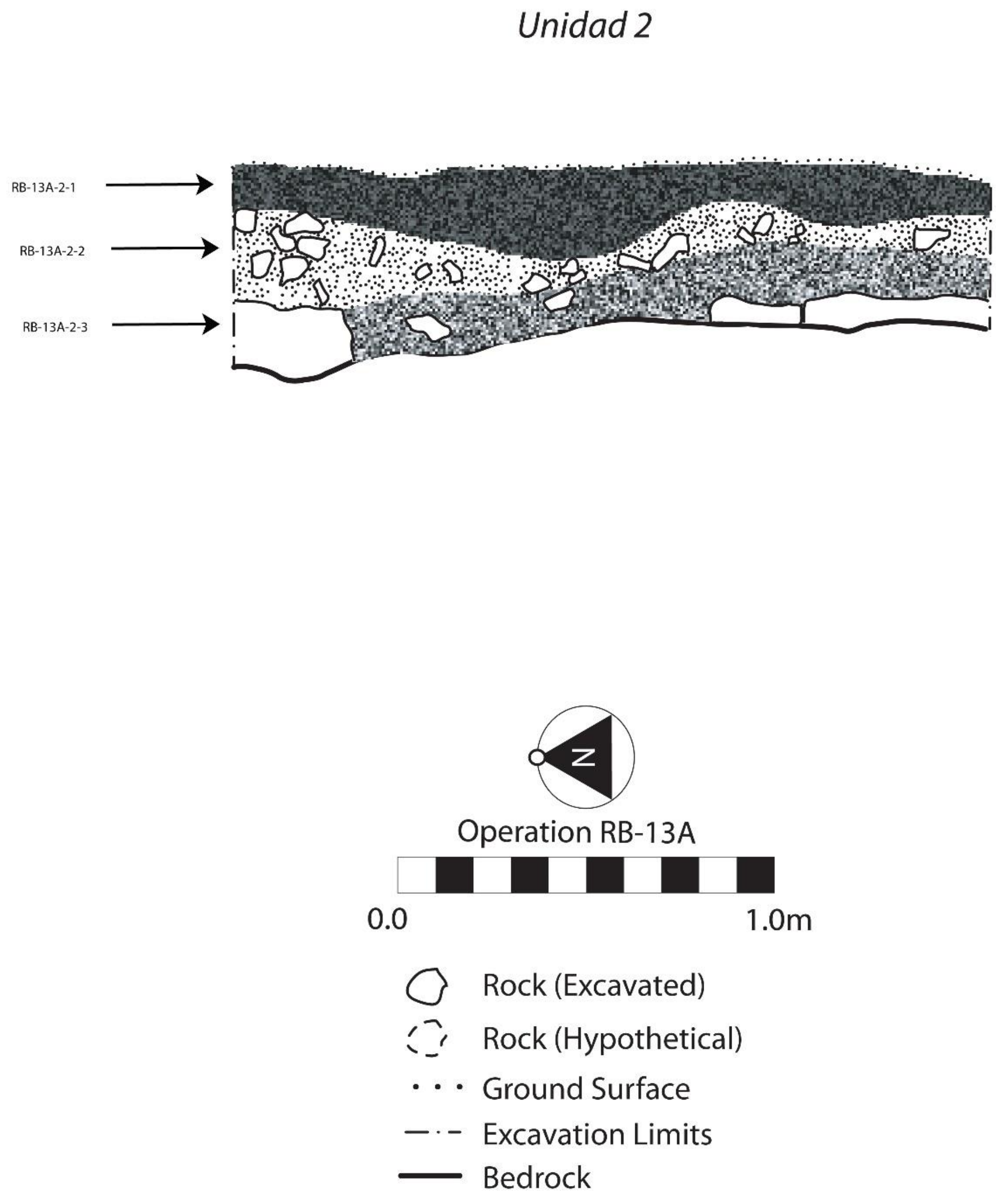


Figure A.60 Unit profile of RB-13A-2 (Drawing by Y. Cabrera and J. Dobereiner).

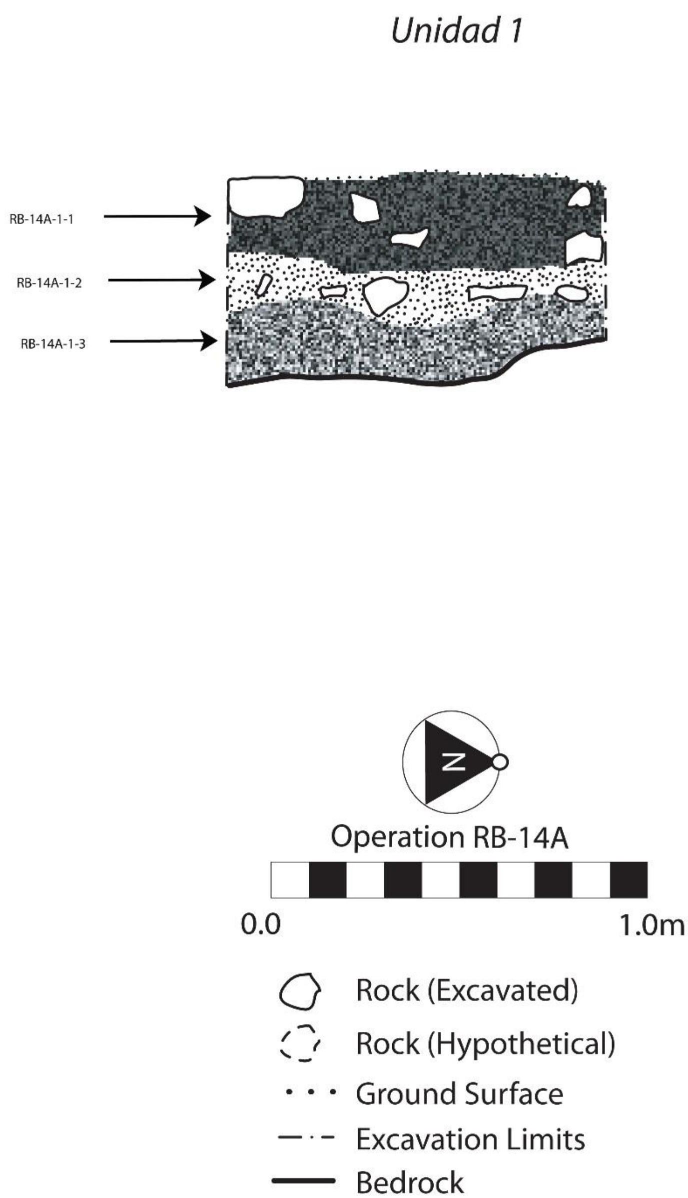


Figure A.61 Unit profile of RB-14A-1 (Drawing by O. Molina and J. Dobereiner).

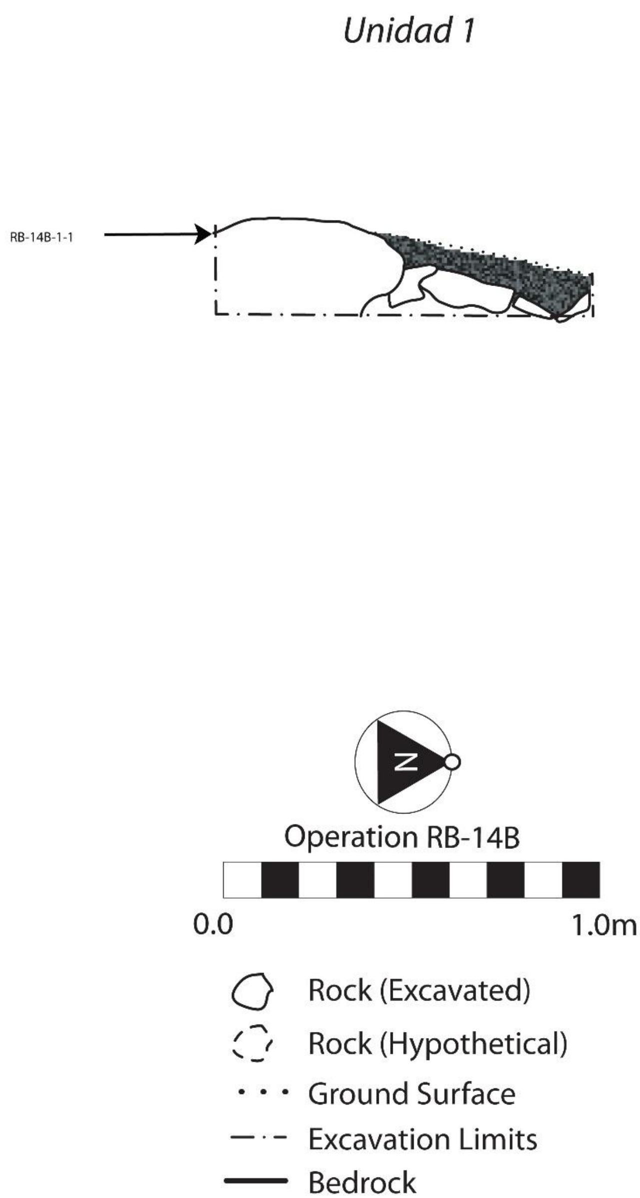


Figure A.62 Unit profile of RB-14B-1 (Drawing by O. Molina and J. Dobereiner).

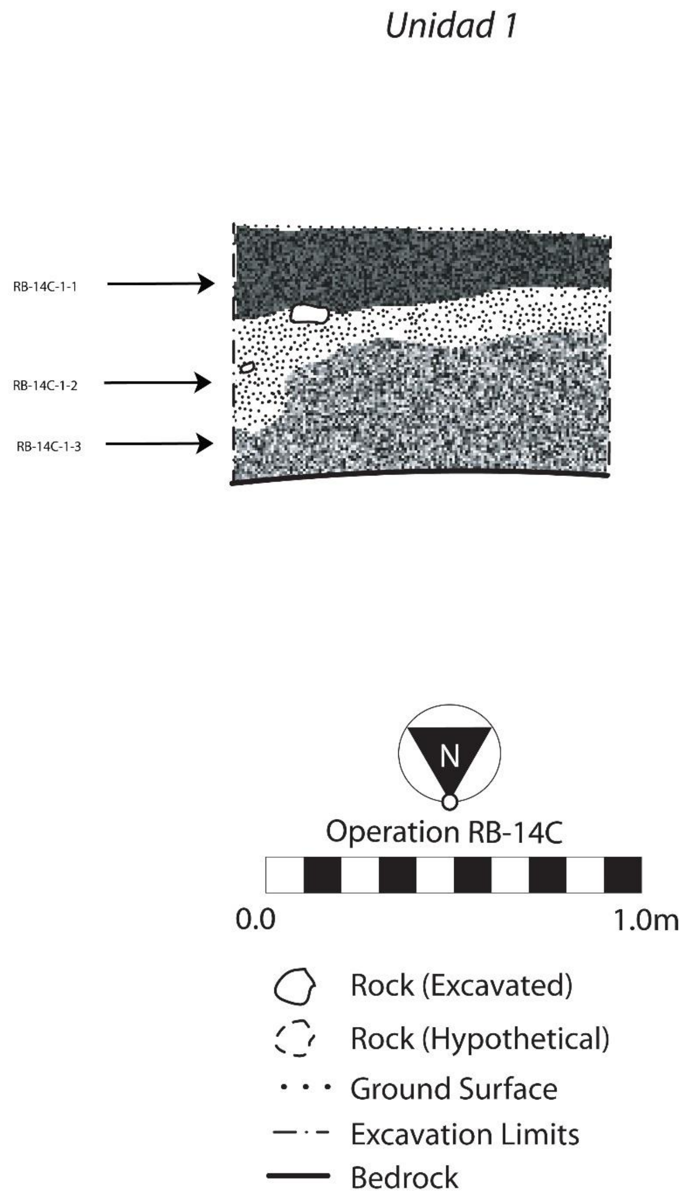


Figure A.63 Unit profile of RB-14C-1 (Drawing by O. Molina and J. Dobereiner).

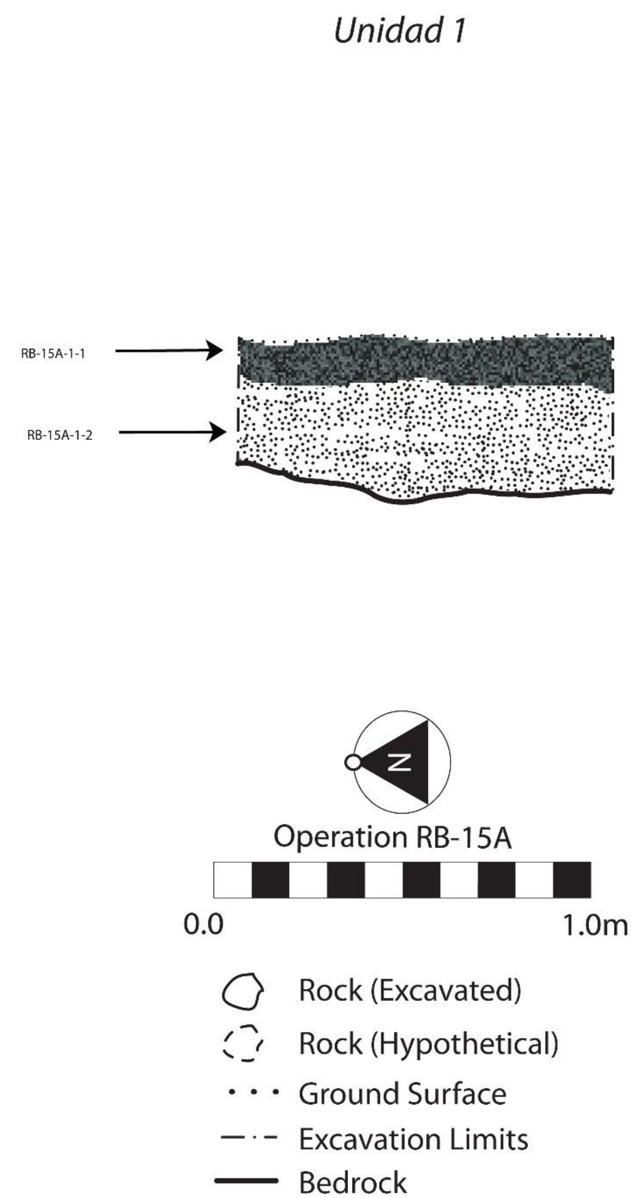


Figure A.64 Unit profile of RB-15A-1 (Drawing by O. Molina and J. Dobereiner).

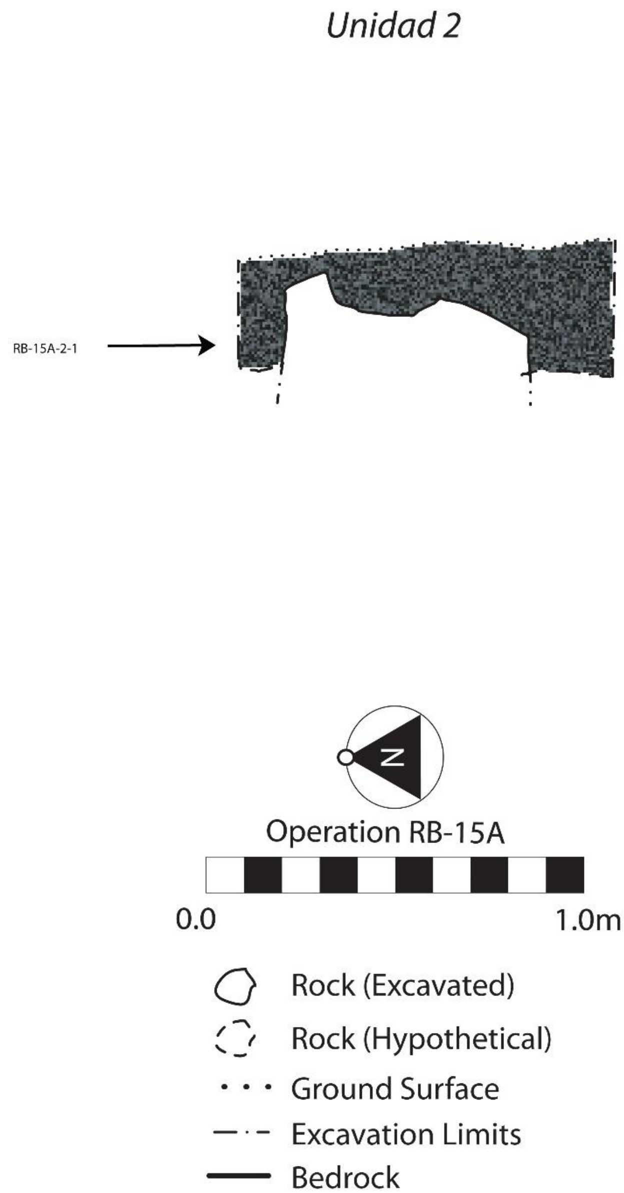


Figure A.65 Unit profile of RB-15A-2 (Drawing by O. Molina and J. Dobereiner).

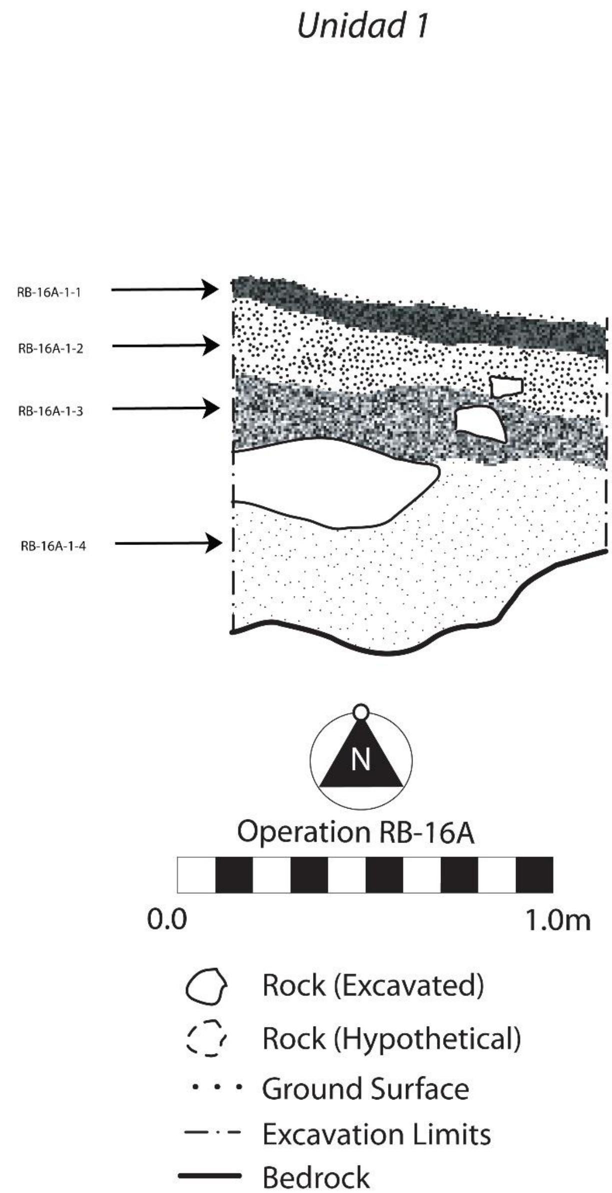


Figure A.66 Unit profile of RB-16A-1 (Drawing by O. Molina and J. Dobereiner).

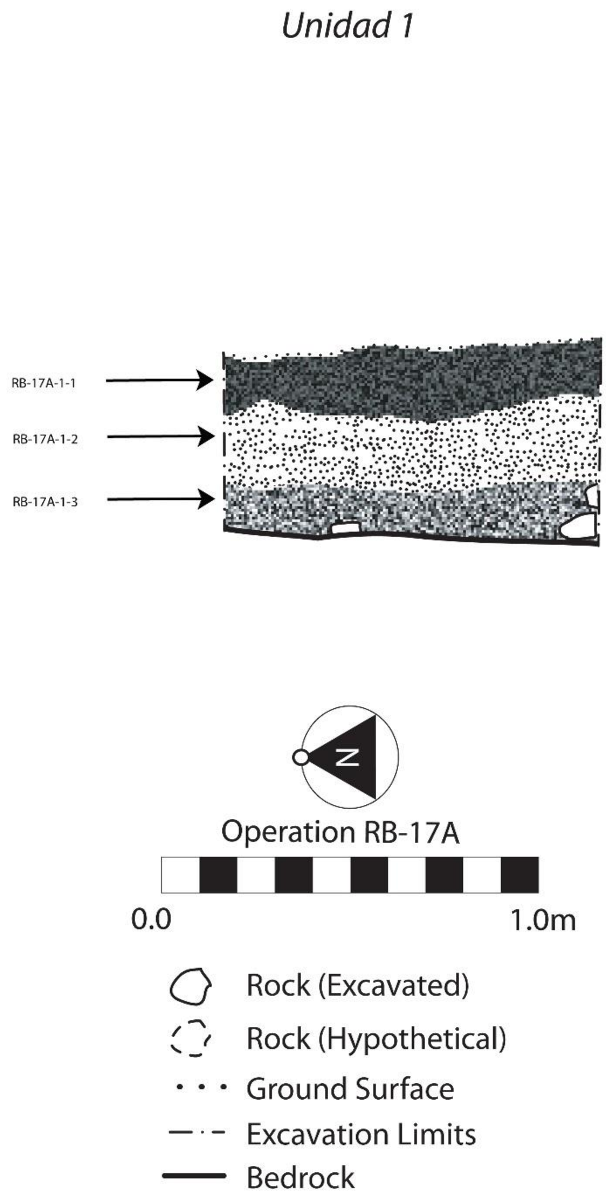


Figure A.67 Unit profile of RB-17A-1 (Drawing by O. Molina and J. Dobereiner).

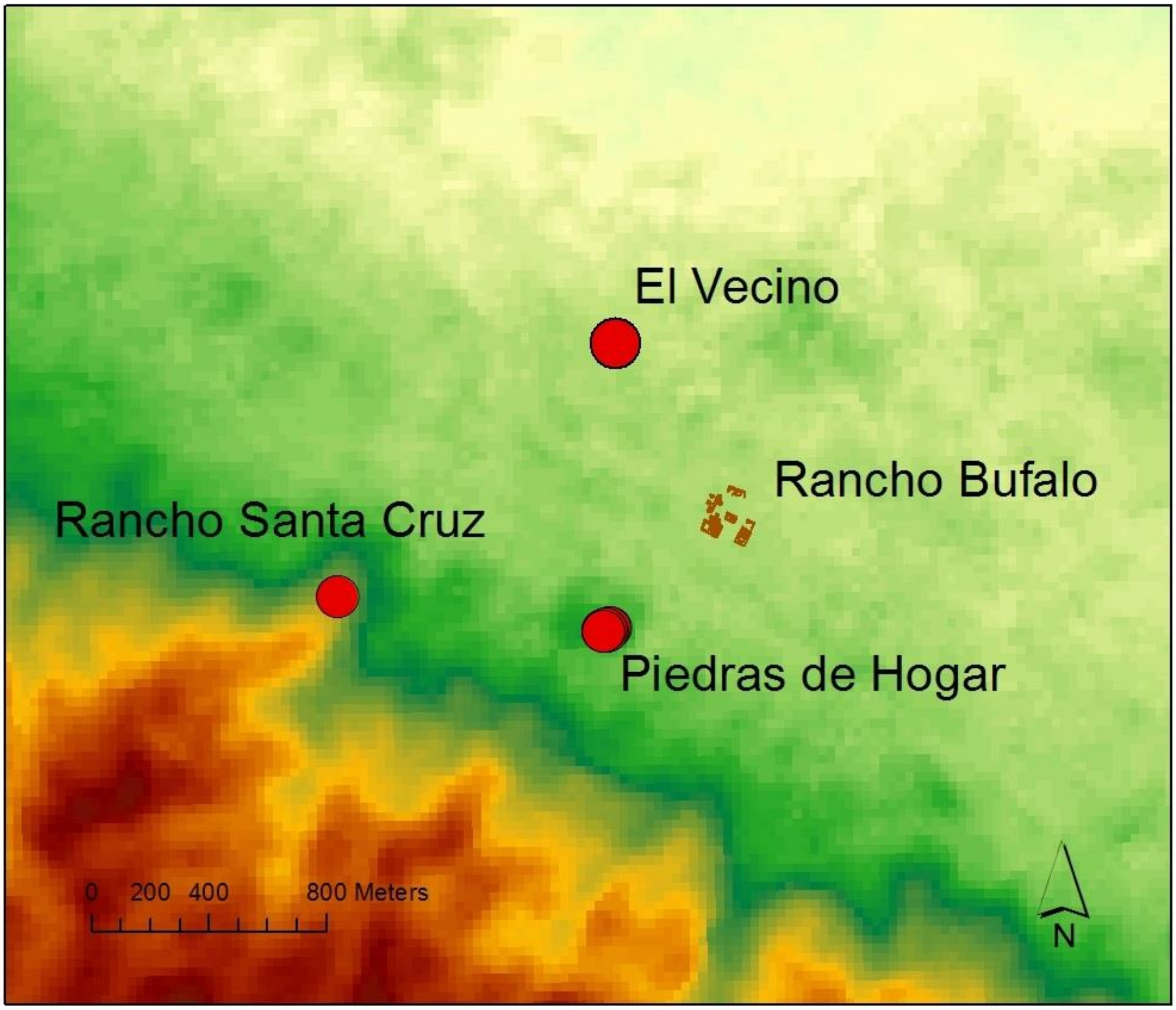


Figure A.68 Map showing additional groups proximate to Rancho Búfalo which were mapped (Map by J. Dobereiner).

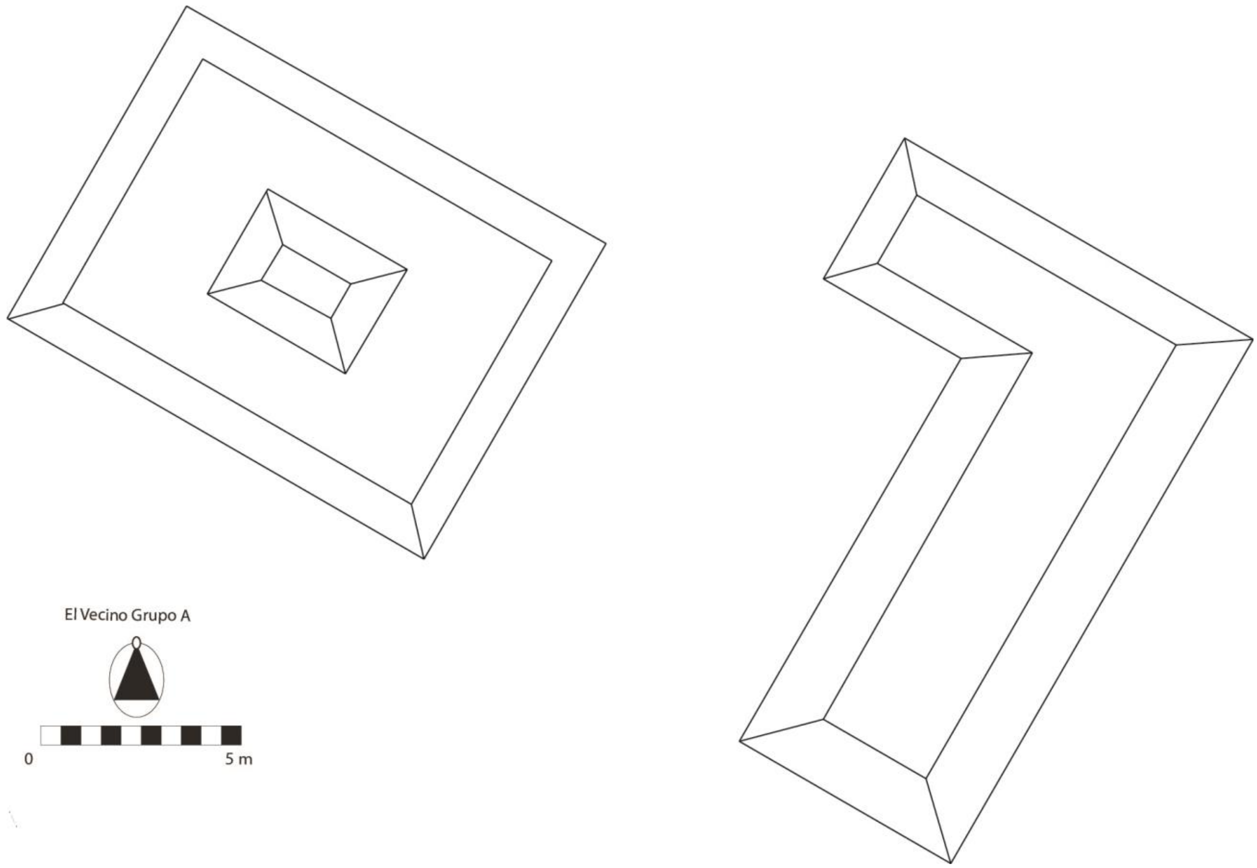


Figure A.69 Sketch map of El Vecino Group A (Map by J. Dobereiner).

Figure A.70 L shaped platform in El Vecino Group A (Photo by J. Dobereiner).

Figure A.71 Small platform in center of El Vecino Group A (Photo by J. Dobereiner).

Figure A.72 Central step on small platform in center of El Vecino Group A (Photo by J. Dobereiner).

Figure A.73 Plaza altar at Group del Cruzes at Palenque, Chiapas, Mexico (Photo by J. Dobereiner).

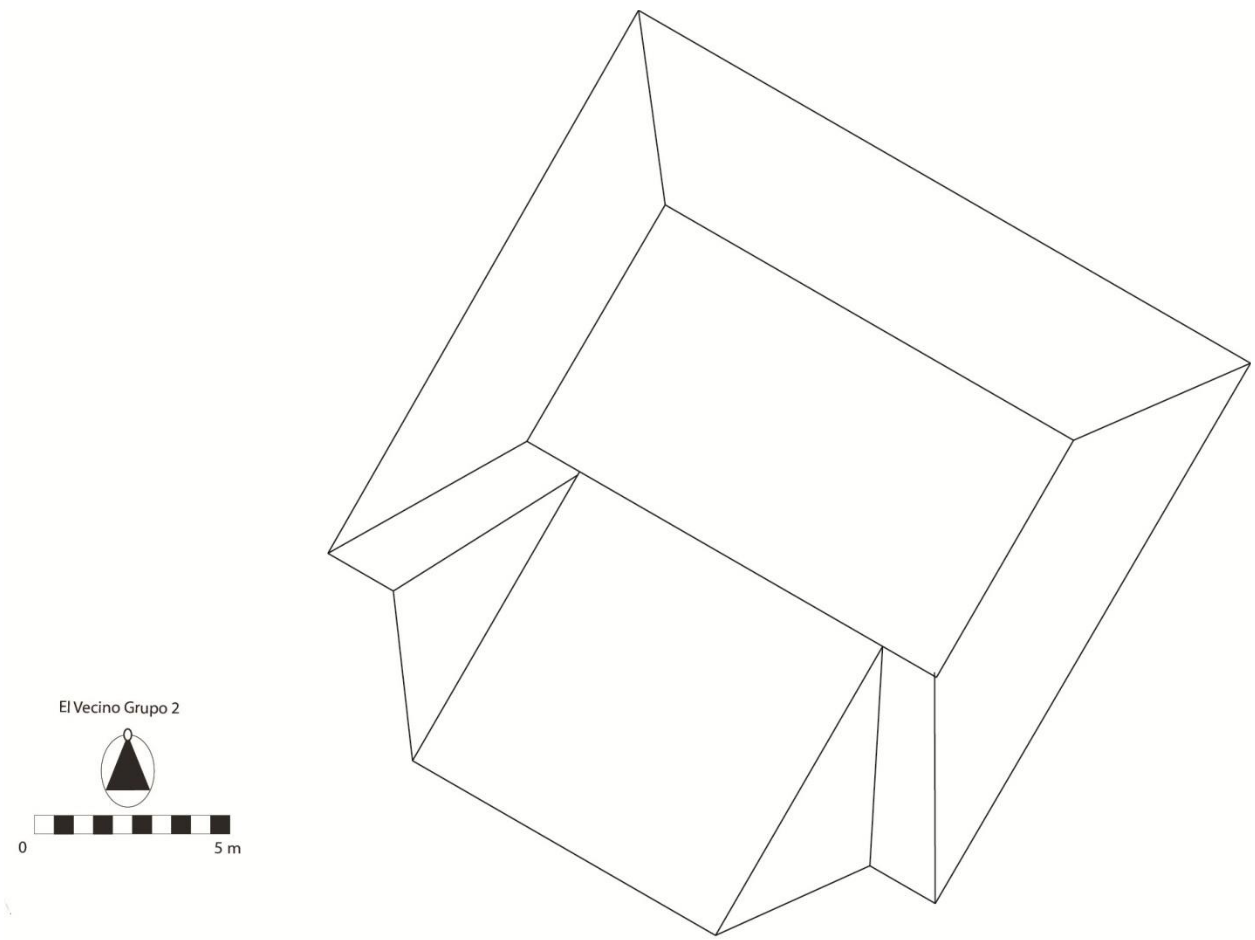


Figure A.74 Sketch map of El Vecino Group B (Map by J. Dobereiner).

Figure A.75 Large platform mound in El Vecino Group B (Photo by J. Dobereiner).

Figure A.76 Surface ceramics recovered from plowed field near El Vecino Group A (Photo by J. Dobereiner).

Figure A.77 View of Rancho Búfalo from Hearthstones Group (Photo by J. Dobereiner).

Figure A.78 Defensive wall on access route to Hearthstones group (Photo by J. Dobereiner).

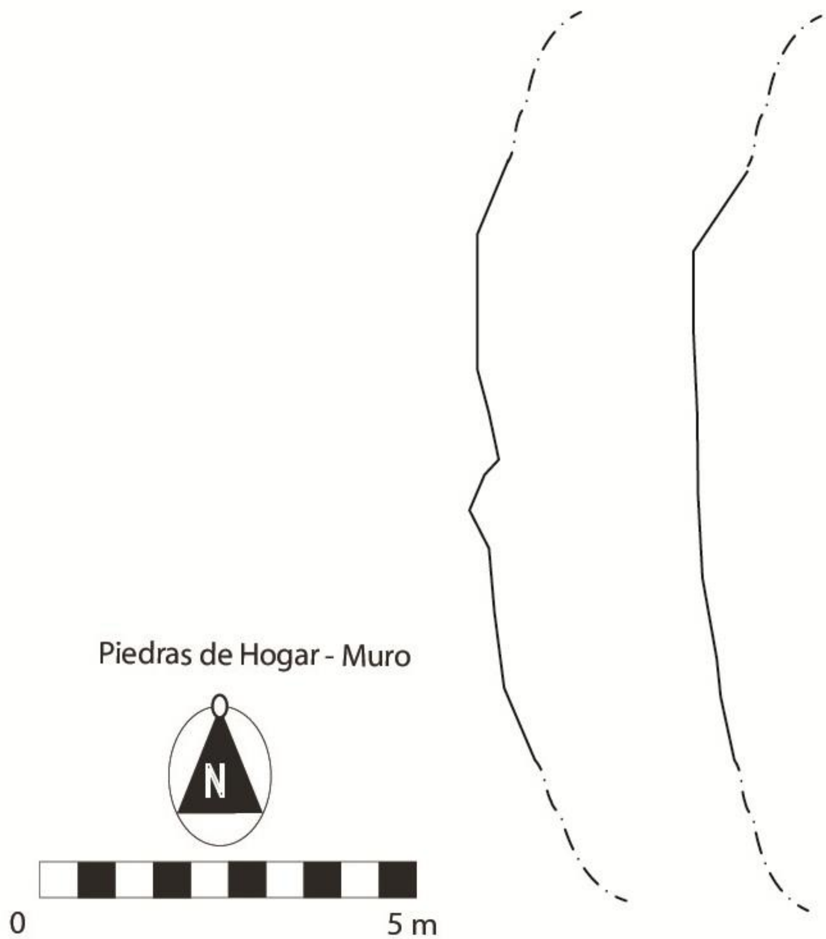


Figure A.79 Sketch map of defensive wall on access route to Hearthstones group (Map by J. Dobereiner).

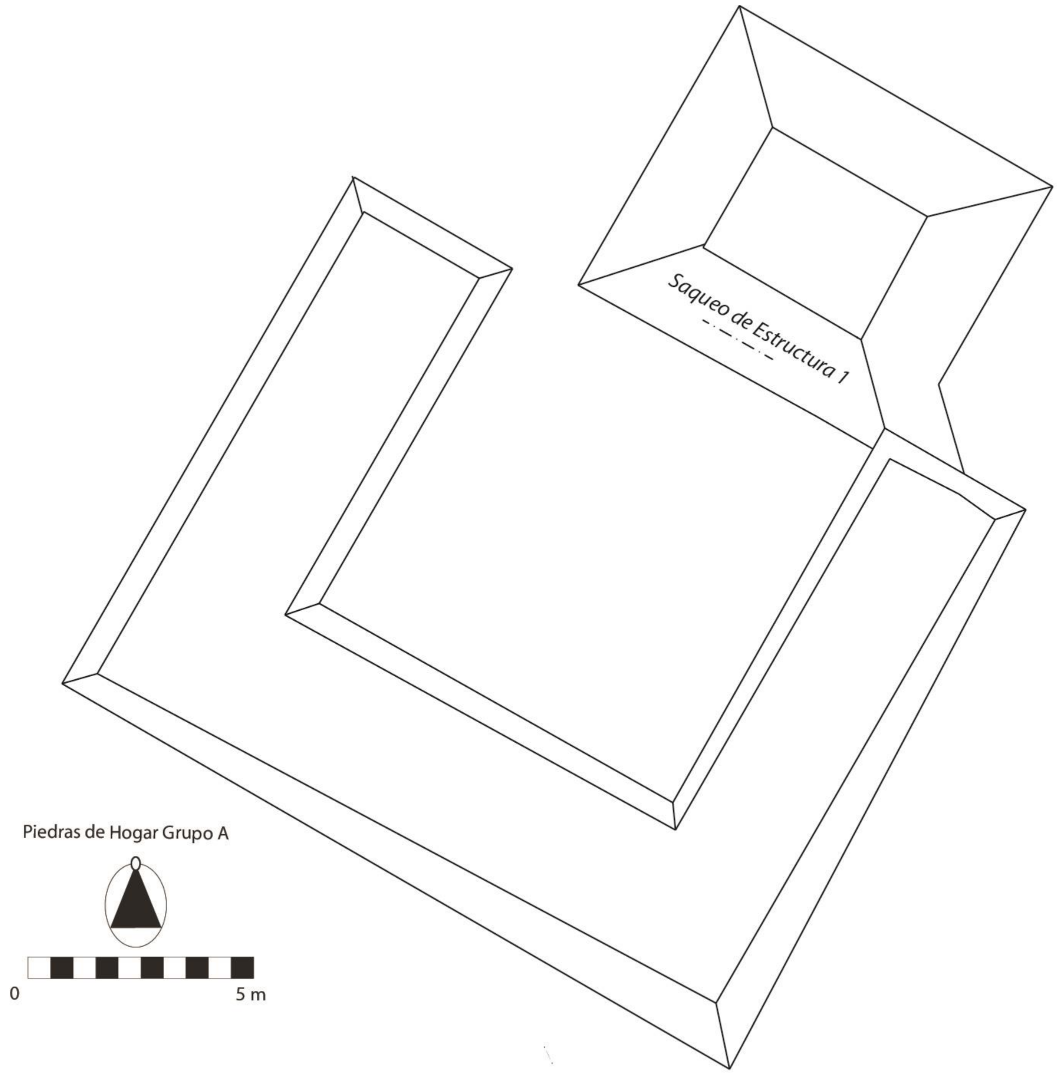


Figure A.80 Sketch map of Hearthstones Group A (Map by J. Dobereiner).


Figure A.81 Hearthstones Group A patio group (Photo by J. Dobereiner).


Figure A.82 Photo of looted tomb in Hearthstones Group A (Photo by J. Dobereiner).

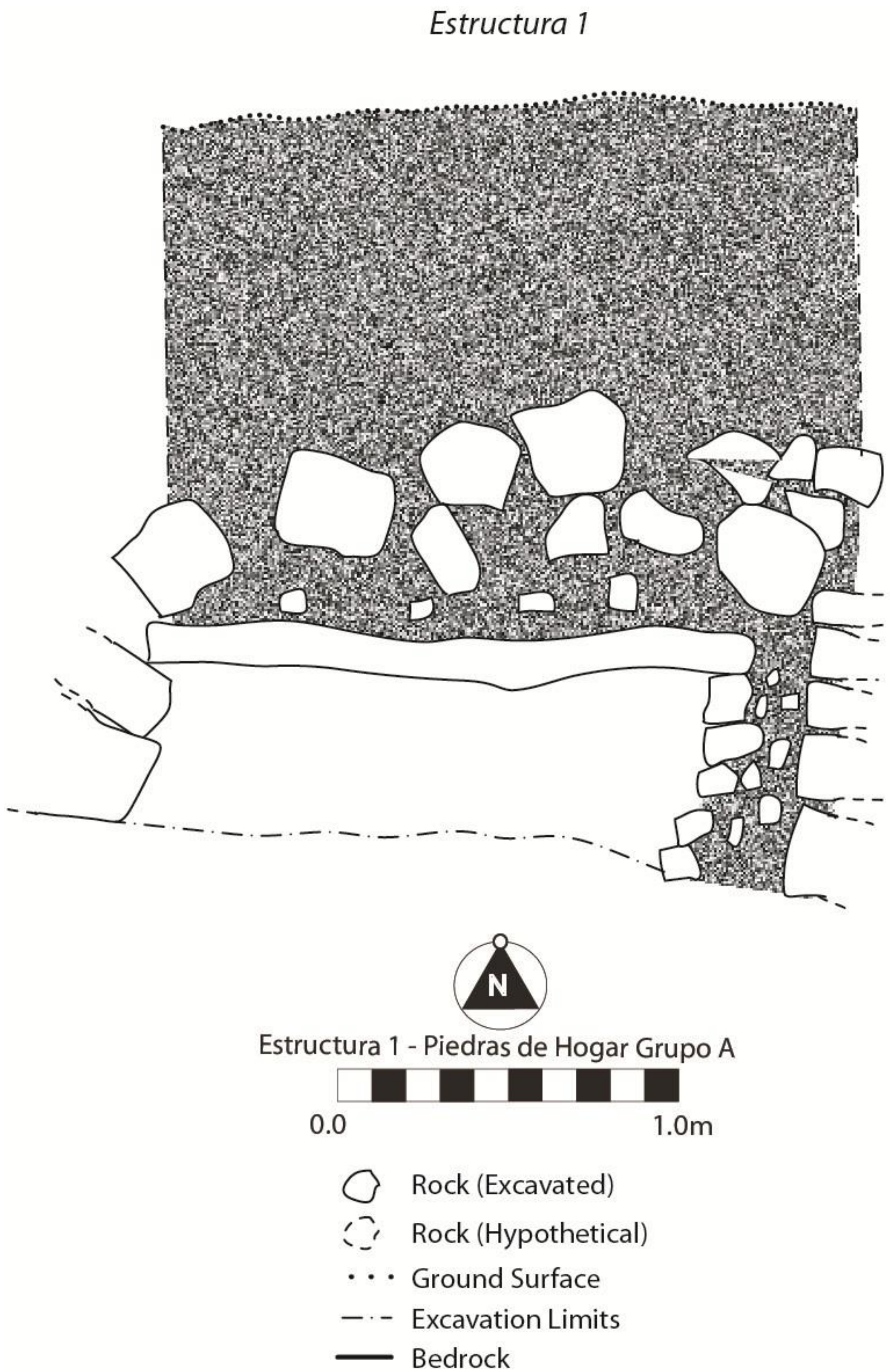


Figure A.83 Drawing of looted tomb in Hearthstones Group A (Drawing by J. Dobereiner).

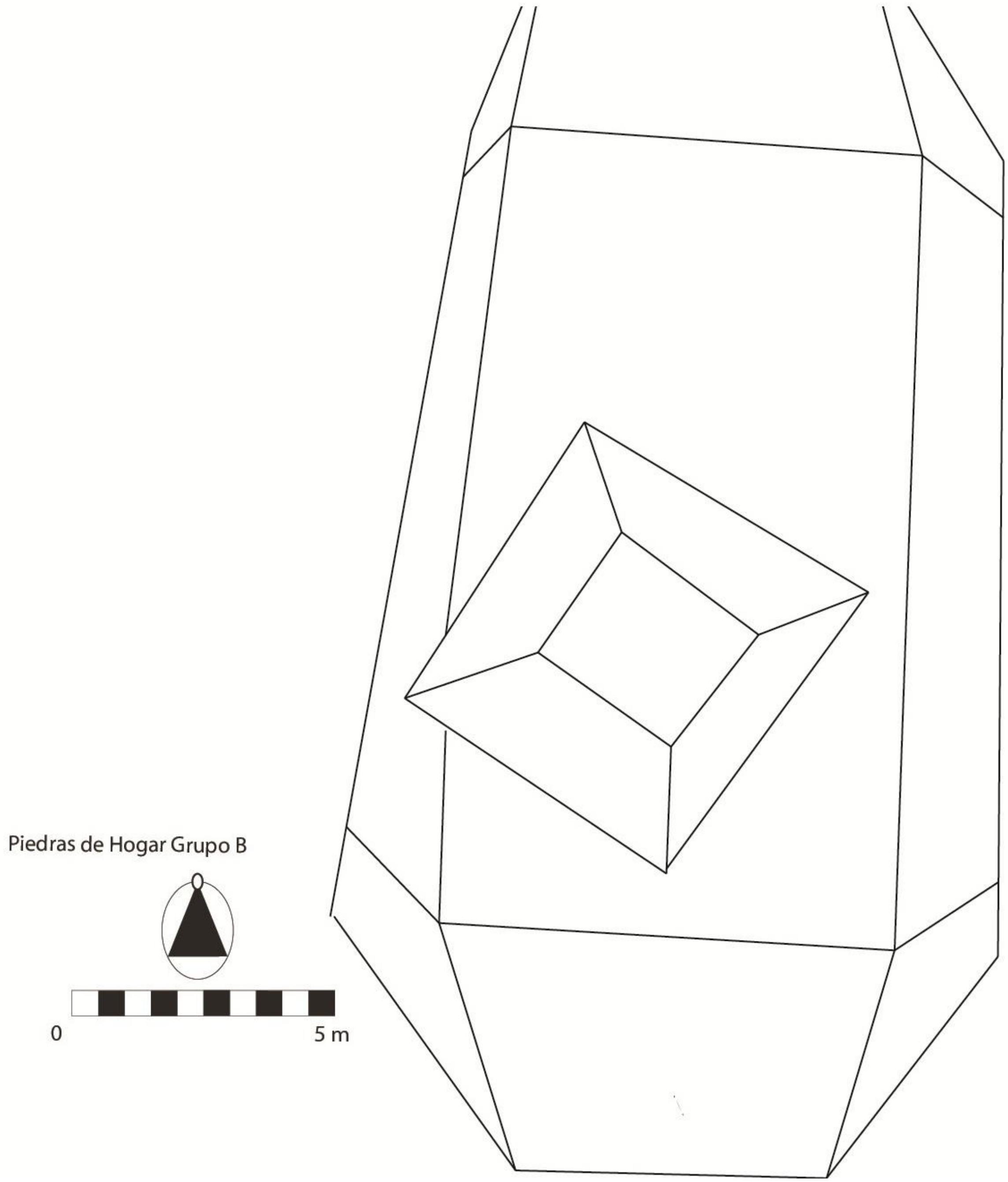


Figure A.84 Sketch map of Hearthstones Group B (Map by J. Dobereiner).


Figure A.85 Structure photo of Hearthstones Group B (Photo by J. Dobereiner).

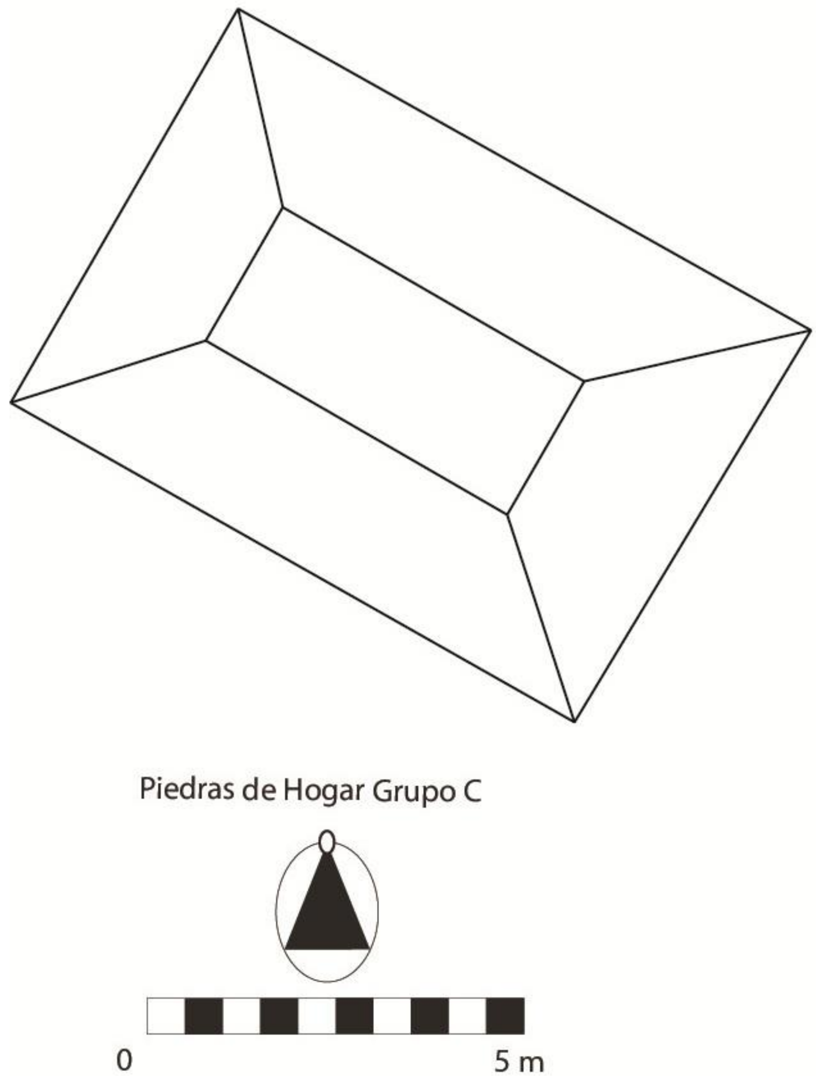


Figure A.86 Sketch map of Hearthstones Group C (Map by J. Dobereiner).


Figure A.87 Structure photo of Hearthstones Group C (Photo by J. Dobereiner).

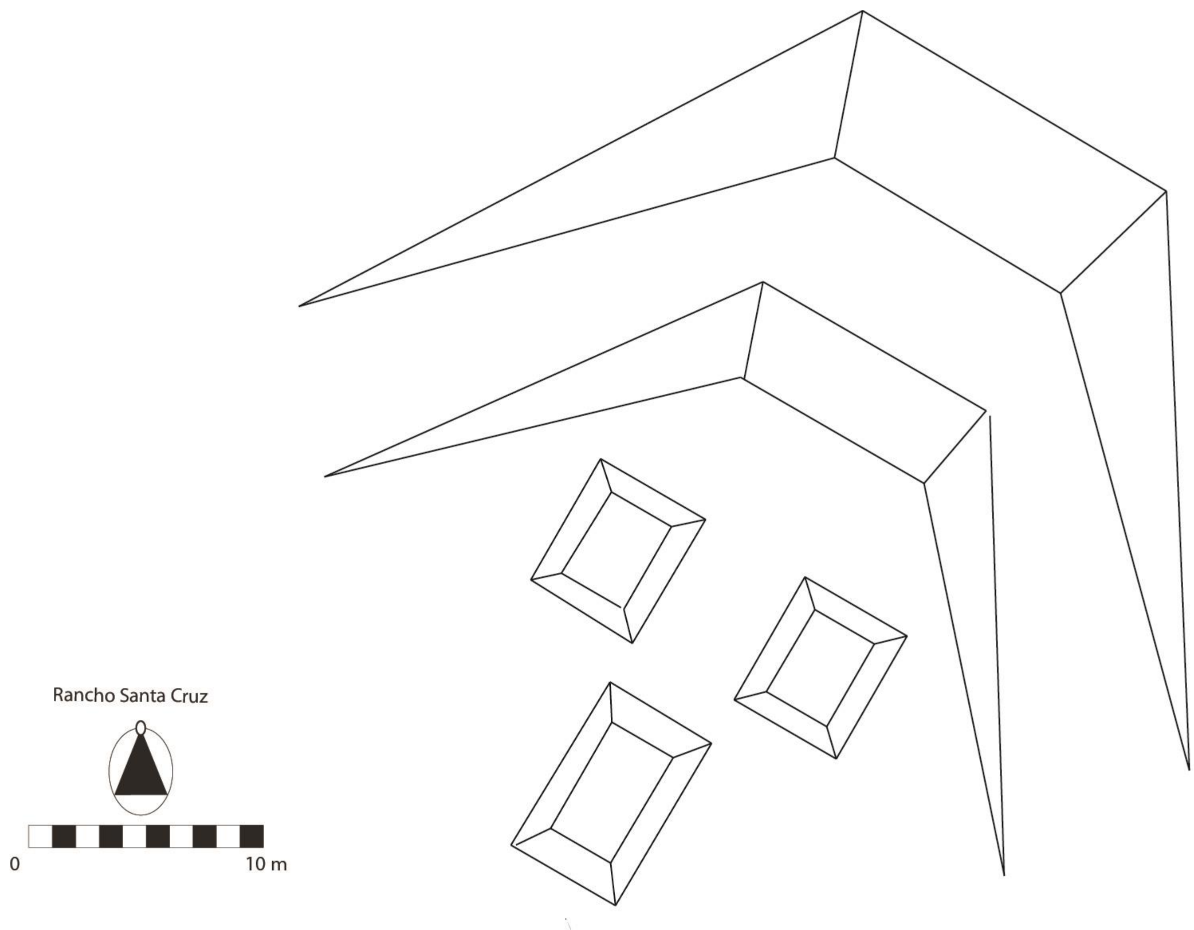


Figure A.88 Sketch map of Rancho Santa Cruz (Map by J. Dobereiner).


Figure A.89 Photo showing anthropogenic terraces at Rancho Santa Cruz, as viewed from Hearthstones group (Photo by J. Dobereiner).


Figure A.90 Flat terrace with structures at Rancho Santa Cruz (Photo by J. Dobereiner).


Figure A.91 View from Rancho Santa Cruz to the Northeast (Photo by J. Dobereiner).


Figure A.92 Active looting at Rancho Santa Cruz (Photo by J. Dobereiner).

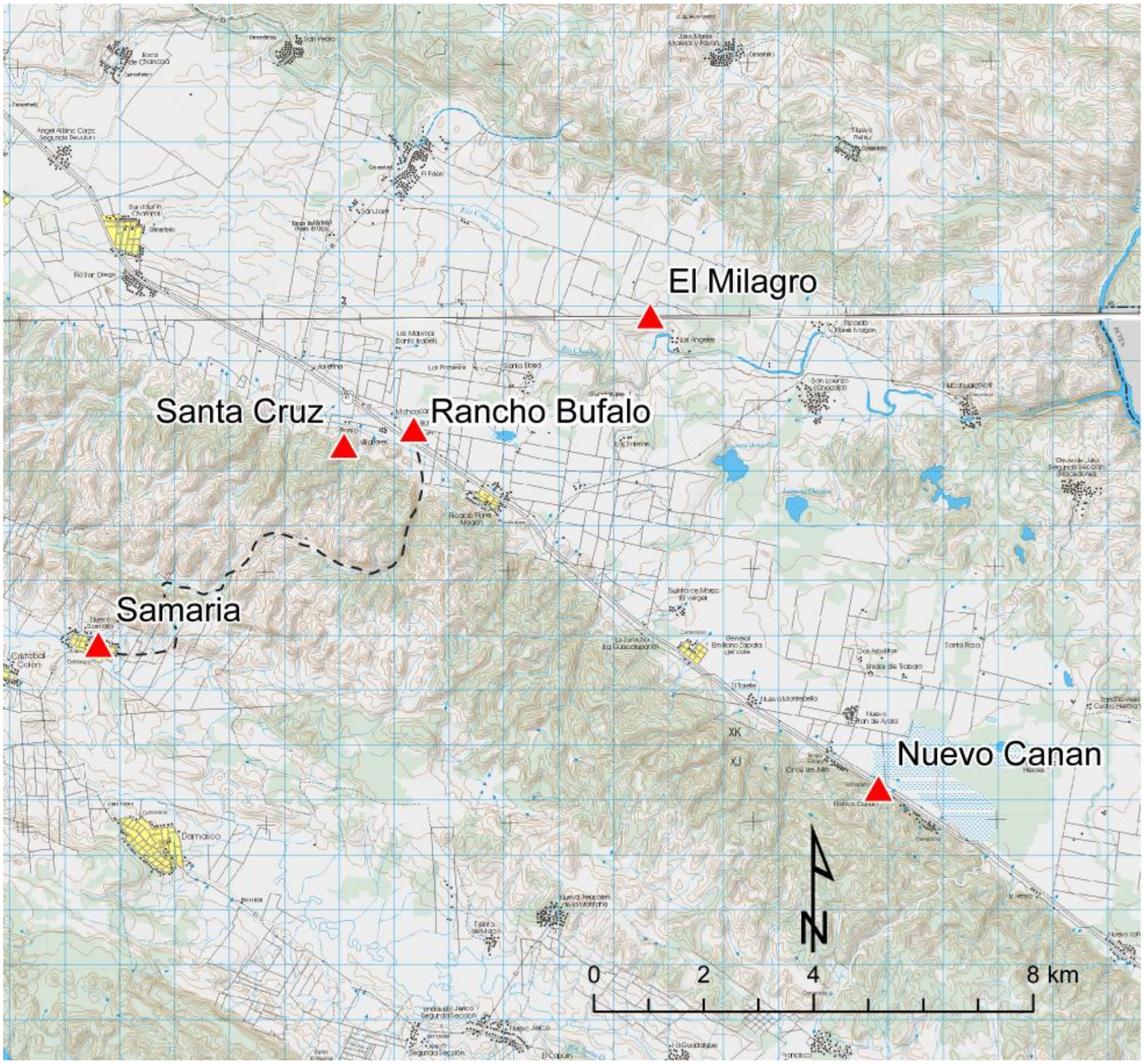


Figure A.93 Map showing regional archaeological zones mapped in the region surrounding Rancho Búfao: Rancho El Milagro and the canyon between Rancho Búfalo and Samaria. (Map by C. Golden and J. Dobereiner).

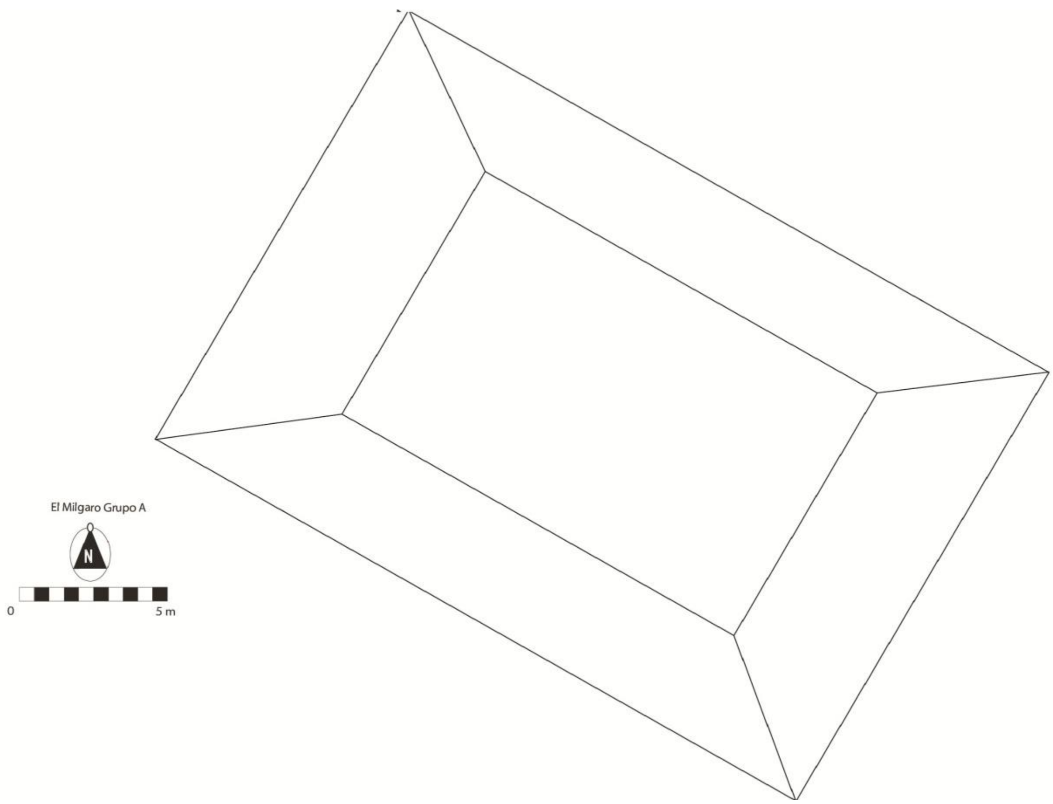


Figure A.94 Sketch map of Rancho El Milagro Group A (Drawing by J. Dobereiner).

Figure A.95 Looted platform at Rancho El Milagro Group A, located with a view of the Valley (Photo by J. Dobereiner).

Figure A.96 View from El Milagro Group A, to the east crossing the North-South valley of the Usumacinta River (Photo by J. Dobereiner).

Figure A.97 Looted platform at Rancho El Milagro Group A (Photo by J. Dobereiner).

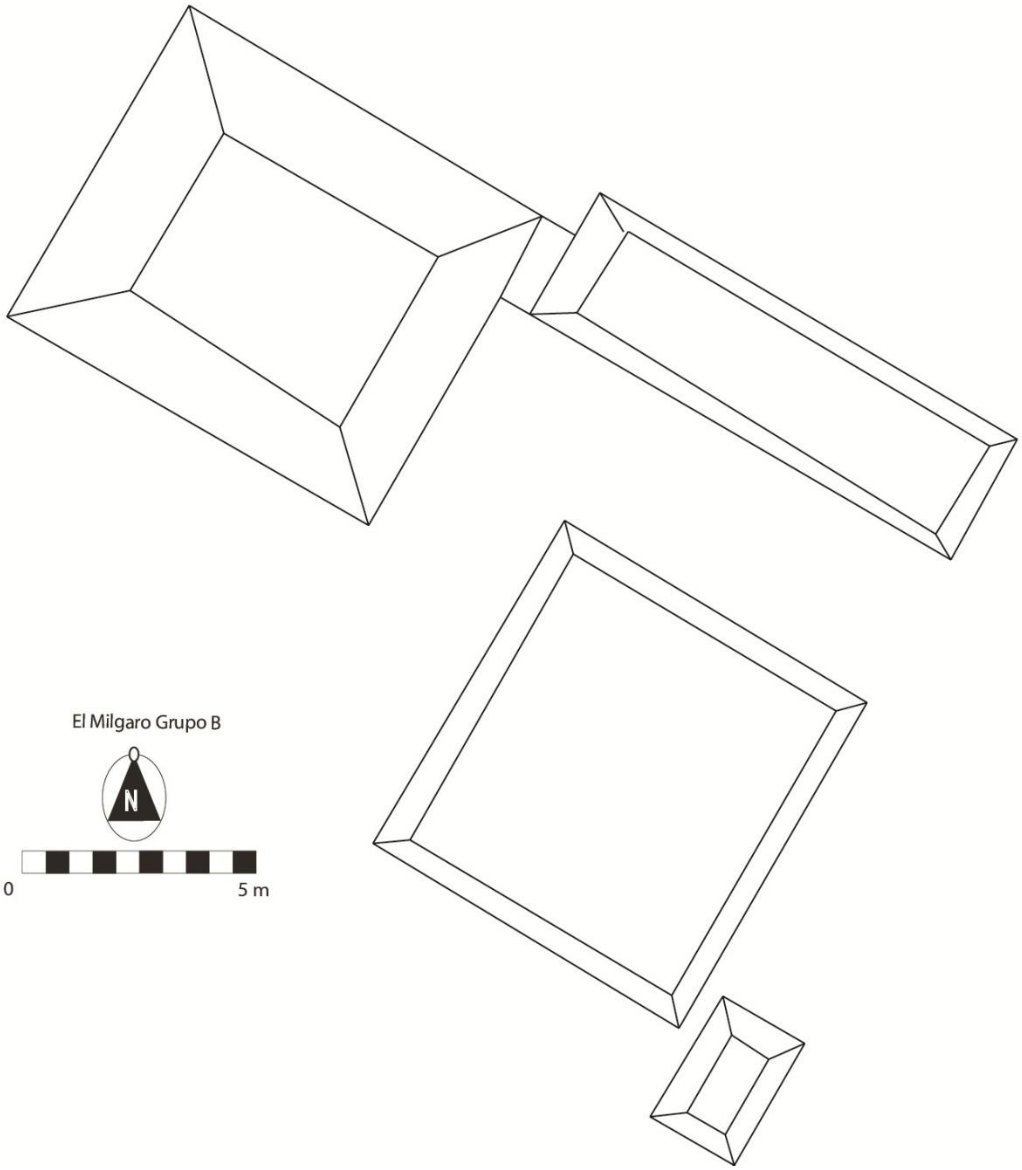


Figure A.98 Sketch map of Rancho El Milagro Group B (Drawing by J. Dobereiner).

Figure A.99 L shaped platform at Rancho El Milagro Group B (Photo by J. Dobereiner).

Figure A.100 Chert quarry on the Rancho El Milagro hill (Photo by J. Dobereiner).

Figure A.101 Canyon between Flores Magon and Samaria, viewed from Rancho Búfalo (Photo by C. Golden).

Figure A.102 Cleared route in canyon between Flores Magon and Samaria, with gravel from train tracks dating to early 20th century (Photo by J. Dobereiner).


Figure A.103 ***Ejido*** **of Samaria, with members of the community (Photo by J. Dobereiner).**

APPENDIX B - RANCHO BÚFALO CERAMIC ANALYSIS

Tables in this appendix are denoted by the letter "B" preceding the table number.

Ceramic Modal Analysis

Table B.1 Ceramic Modal analysis based on slips for Rancho Búfalo, Chiapas, Mexico.
Technologies = W (Waxy), OT (Other), X (Unslipped), K (Krazing), M (Mottled), U (Polished), P (Polychrome), G (Glossy), S (Streaky), A (Classic period Fineware)
Colors = A (Orange), R (Red), N (Black), B (Beige), H1 (Red and Black), H2 (Beige and Black), H3 (Black and Cream), H4 (Beige and Red), S (No Color), C (Cream)
Forms = C (Dish), O (Jar), T (Tecomate), I (Incense Burner), Z (*Cazuela*), U (Unidentified)
Decorations = BA (Low Relief), MO (Modeled), I (Incised), F (Fluting), G (Grooved), S (Deep Striations), B (Bichromic with red paint), P (Impressed), D (Complex incised decoration), N (No Decoration), E (Graffiti), L = Shallow Striations

Technologies:

Table B.1

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
1	RB-8A-3-4	W	B	O	N		2
2	RB-8A-3-4	W	R	C	N		1
3	RB-8A-3-4	K	B	C	N	1D	2
4	RB-8A-3-4	W	N	O	N		1
5	RB-8A-3-4	W	N	C	N	2D	4
6	RB-8A-3-4	X	J	V	N		12
7	RB-8A-3-4	W	R	C	I	1D	1
8	RB-8A-3-4	X	N	O	N	1D	1
9	RB-11A-2-1	X	S	V	N		200
10	RB-11A-2-1	X	S	O	N	9D	9
11	RB-11A-2-1	X	S	C	N	3D	3
12	RB-11A-2-1	W	S	I	N	1D	1
13	RB-11A-2-1	W	W	C	N	3D	26
14	RB-11A-2-1	K	W	C	I	1D	1
15	RB-11A-2-1	K	K	C	E		1
16	RB-11A-2-1	W	K	C	N		2
17	RB-11A-2-1	W	W	O	N		23
18	RB-11A-2-1	W	W	C	N	9D	51
19	RB-11A-2-1	W	W	C	F	3D	3
20	RB-11A-2-1	W	A	C	N	1D	28
21	RB-11A-2-1	W	N	C	N	3D	23
22	RB-11A-2-1	X	S	O	S		11
23	RB-11A-3-1	X	S	U	N		210
24	RB-11A-3-1	X	S	O	L		25
25	RB-11A-3-1	X	S	O	S		17
26	RB-11A-3-1	X	S	A	N	1D	1
27	RB-11A-3-1	X	S	I	P	1D	1
28	RB-11A-3-1	X	S	C	P	2D	2
29	RB-11A-3-1	X	S	O	N	6D	6
30	RB-11A-3-1	X	S	C	I	1D	1
31	RB-11A-3-1	X	S	C	N	8D	8

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
32	RB-11A-3-1	W	R	C	F	3D	3
33	RB-11A-3-1	W	H4	C	N	1D	1
34	RB-11A-3-1	K	N	O	N		3
35	RB-11A-3-1	K	C	C	N	2D	2
36	RB-11A-3-1	W	C	C	N		3
37	RB-11A-3-1	K	R	C	N		1
38	RB-11A-3-1	P	C	C	B		1
39	RB-11A-2-1	W	H1	C	N		4
40	RB-11A-2-1	W	H2	C	N	3D	4
41	RB-11A-2-1	W	A	T	N		1
42	RB-11A-2-1	W	H2	C	I	1D	1
43	RB-11A-2-1	W	N	C	I	1D	1
44	RB-11A-2-1	X	S	O	L		8
45	RB-11A-2-1	W	B	C	N	3D	12
46	RB-11A-2-1	K	H2	C	I	1D	1
47	RB-11A-2-1	W	H3	C	N		2
48	RB-11A-2-1	M	B	C	N	3D	6
49	RB-11A-2-1	U	S	U	N	3D	80
50	RB-11A-2-1	W	C	C	N		2
51	RB-11A-2-1	M	N	C	B	Pintura Roja	1
60	RB-11A-3-1	K	C	O	I		1
61	RB-11A-3-1	W	R	O	N		9
62	RB-11A-3-1	W	B	C	N		7
63	RB-11A-3-1	G	R	O	N		1
64	RB-11A-3-1	W	H4	C	N		4
65	RB-11A-3-1	W	A	O	N		3
66	RB-11A-3-1	W	R	C	N	2D	13
67	RB-11A-3-1	W	N	O	N	2D	8
68	RB-14C-1-2	X	S	U	N		23
69	RB-14C-1-2	X	S	O	L		1
70	RB-14C-1-2	W	R	O	N		1
71	RB-14C-1-2	W	R	C	N		2
73	RB-14C-1-1	W	H9	C	X	1D	2
74	RB-14C-1-1	W	B	C	X		2
75	RB-14C-1-1	W	H2	C	X	1D	1
76	RB-14C-1-1	W	R	O	X		1
77	RB-14C-1-1	W	R	C	X	1D	4
78	RB-14C-1-1	X	X	O	X	1D	1
79	RB-14C-1-1	X	X	C	X	1D	1
80	RB-14C-1-1	X	X	C	I	1	1
81	RB-14C-1-1	X	X	O	L		2
82	RB-14C-1-1	X	X	X	X		69
83	RB-14C-1-2	W	B	C	N	2D	4
84	RB-17A-1-1	U	U	C	N		2
85	RB-7A-1-2	X	S	C	N		100
86	RB-7A-1-2	U	S	O	N		27
87	RB-7A-1-2	W	C	O	N		1
88	RB-7A-1-2	W	A	C	N		1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
89	RB-7A-1-2	W	N	C	S		1
90	RB-7A-1-2	U	S	O	F		1
91	RB-7A-1-2	W	R	C	N		3
92	RB-7A-1-2	X	S	Z	N		1
93	RB-7A-1-2	W	N	C	F		1
95	RB-7A-1-2	X	X	O	N	1D	1
96	RB-7A-1-2	U	B	C	N		11
97	RB-7A-1-2	X	S	O	L		1
98	RB-13A-2-2	K	B	C	X		1
99	RB-13A-2-2	W	R	C	X		1
100	RB-13A-2-2	X	X	X	X		28
101	RB-13A-2-2	G	X	X	X		4
102	RB-13A-2-2	X	X	O	X	3D	3
103	RB-16A-1-2	K	C	C	X		3
104	RB-16A-1-2	X	X	C	P	1D	1
105	RB-16A-1-2	X	X	X	X	1D	200
106	RB-16A-1-2	W	N	C	X	1D	7
107	RB-16A-1-2	W	C	C	X		2
108	RB-16A-1-2	X	X	O	L		1
109	RB-16A-1-2	W	R	C	X		16
110	RB-9B-1-2	W	R	C	X	3D	14
111	RB-9B-1-2	M	N	C	I	1D	1
112	RB-9B-1-2	W	R	C	X	1D DRILLED	1
113	RB-9B-1-2	K	H1	C	X		2
114	RB-9B-1-2	W	H4	C	X		8
115	RB-9B-1-2	W	H2	C	X	3D	5
116	RB-9B-1-2	M	A	C	X	1D	1
117	RB-9B-1-2	W	N	C	X	1D	10
118	RB-9B-1-2	W	B	O	X		7
119	RB-9B-1-2	W	B	C	X	3D	3
120	RB-9B-1-2	W	C	C	X		7
121	RB-9B-1-2	W	N	O	I	2D	2
122	RB-13A-2-2	X	X	C	X	1D	1
123	RB-14A-1-3	X	X	O	S		8
124	RB-14A-1-3	W	R	C	F	1D	1
125	RB-14A-1-3	W	X	C	G	1D	1
126	RB-14A-1-3	W	R	C	G	1D	1
127	RB-14A-1-3	X	X	O	L		9
128	RB-14A-1-3	W	N	C	C	1D	1
129	RB-14A-1-3	W	N	C	X		2
130	RB-14A-1-3	W	R	C	X		2
131	RB-14A-1-3	K	H4	C	X		1
132	RB-14A-1-3	X	X	CZ	G	1D	1
133	RB-14A-1-3	X	X	O	X	1D	1
134	RB-14A-1-3	G	X	X	X		1
135	RB-14A-1-3	W	X	C	X		1
136	RB-14A-1-3	X	X	X	X		15
137	RB-16A-1-3	W	X	X	I	Posible Glifo	1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
138	RB-16A-1-3	M	C	C	X	1D Pintura roja	3
139	RB-16A-1-3	W	R	C	X		7
140	RB-16A-1-3	W	A	C	R		1
141	RB-13A-2-1	X	X	X	X		23
142	RB-13A-2-1	X	X	O	X	5D	5
143	RB-13A-2-1	X	X	C	X	5D	5
144	RB-13A-2-1	W	R	C	X	1D	2
145	RB-14B-1-1	W	X	U	X		3
146	RB-15A-2-1	W	X	X	X		2
147	RB-15A-2-1	X	X	X	X		4
149	RB-16A-1-1	K	H1	C	X		1
150	RB-16A-1-1	X	X	X	X		10
151	RB-16A-1-1	W	X	X	X		2
152	RB-16A-1-2	X	X	X	X		11
153	RB-16A-1-2	K	B	C	I	CREMA/ROJO	1
154	RB-16A-1-2	M	B	C	X	BAYO/NEGRO	1
155	RB-16A-1-2	S	R	C	X	1D	2
156	RB-16A-1-2	W	B	X	X		1
157	RB-16A-1-2	W	R	C	X	1D	4
158	RB-16A-1-2	W	X	X	X		3
159	RB-16A-1-2	P	X	C	I		1
160	RB-13A-1-1	G	X	C	X	2D	33
161	RB-13A-1-1	W	X	C	X		6
162	RB-13A-1-1	W	N	C	S		1
163	RB-13A-1-1	W	R	O	X		1
164	RB-13A-1-1	X	X	O	S		4
165	RB-13A-1-1	X	X	X	X		4
166	RB-13A-1-1	X	X	O	X	1D	1
167	RB-13A-1-1	X	X	Z	X	4D	4
168	RB-13A-1-1	X	X	C	X	2D	2
169	RB-14-1-2	K	B	C	X		1
170	RB-14-1-2	X	X	O	S	8D	45
171	RB-14-1-2	V	X	O	S	1D	8
172	RB-14-1-2	W	R	C	S	1D	2
173	RB-14-1-2	W	R	O	F	1D	1
174	RB-14-1-2	W	N	C	X	1D	4
175	RB-14-1-2	U	X	C	X		10
176	RB-14-1-2	G	X	C	X		2
177	RB-14-1-2	G	X	C	X		3
178	RB-8B-3-1	G	X	C	X		7
179	RB-9B-1-2	W	N	O	X		7
180	RB-9B-1-2	X	X	X	S		2
181	RB-9B-1-2	X	X	X	X		6
182	RB-9B-1-2	K	R	C	X		1
183	RB-9B-1-2	W	X	X	X		13
184	RB-9B-1-2	W	X	C	X	5D	5
185	RB-9B-1-2	X	X	O	X	4D	4
186	RB-9B-1-2	X	X	X	X		42

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
187	RB-9B-2-1	X	X	X	S		4
188	RB-9B-2-1	W	X	X	X		30
189	RB-9B-2-1	P	X	X	X	1D	1
190	RB-9B-2-1	W	R	C	X	2D	10
191	RB-9B-2-1	W	R	C	F	1D	4
192	RB-9B-2-1	W	H4	C	X		1
193	RB-9B-2-1	K	H3	C	X	1D	1
194	RB-9B-2-1	W	C	C	X	1D	1
195	RB-9B-2-1	X	X	X	X		85
196	RB-9B-2-1	X	X	Z	X	1D	1
197	RB-9B-2-1	X	X	C	X	6D	6
198	RB-9B-1-2	X	X	O	X	2D	2
199	RB-9B-2-2	X	X	O/C	X	19D	338
200	RB-9B-2-2	W	X	C	X		67
201	RB-9B-2-2	W	N	C	X	4D	41
202	RB-9B-2-2	A	X	C	X	2D	2
203	RB-9B-2-2	G	R	C	X		5
204	RB-9B-2-2	X	X	O	L		33
205	RB-9B-2-2	X	X	O	S		7
206	RB-9B-2-2	W	C	C	X	2D	2
207	RB-9B-2-2	W	B	C	X		4
208	RB-9B-2-2	W	R	C	X	2D	7
209	RB-9B-2-2	W	R	C	X	15D	38
210	RB-9B-2-2	M	B	C	X	1D	15
211	RB-9B-2-2	G	R	C	X		4
212	RB-9B-2-2	K	R	C	X		1
213	RB-9B-2-2	K	N	C	X		4
214	RB-9B-2-2	A	R	Z	X	1D	1
215	RB-9B-2-2	M	B	C	X	3D	12
216	RB-9B-2-2	M	B	C	I	1D	1
217	RB-9B-3-1	X	X	Z	X	1D	1
218	RB-9B-3-1	X	X	O	X	5D	5
219	RB-9B-3-1	X	X	O	L		6
220	RB-9B-3-1	W	R	C	X	2D	9
221	RB-9B-3-1	X	X	O	X		100
222	RB-9B-3-1	A	X	C	X	1D	3
223	RB-9B-3-1	OT					1
224	RB-14A-1-2	OT					1
225	RB-9B-2-3	W	N	C	X	5D	28
226	RB-9B-2-3	W	A	C	X		1
227	RB-9B-2-3	K	C	C	X	1D	2
228	RB-9B-2-3	W	C	C	X	1D	3
229	RB-9B-2-3	M	B	C	X	4D	4
230	RB-9B-2-3	W	B	C	X		4
231	RB-9B-2-3	X	X	X	X		131
232	RB-9B-2-3	W	H2	C	X		1
233	RB-9B-2-3	W	H1	C	X	2D	7
234	RB-9B-2-3	M	M	N	X	1D	8

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
235	RB-9B-2-3	W	R	X	X	7D	35
236	RB-9B-1-1	X	X	X	X		178
237	RB-9B-1-1	X	X	O	S		7
238	RB-9B-1-1	X	X	O	L		21
239	RB-9B-1-1	W	X	X	X	5D	105
240	RB-9B-1-1	X	X	Z	X	1D	1
241	RB-9B-1-1	X	X	P	X	1D	1
242	RB-9B-1-1	A	X	C	X	4D	7
243	RB-9B-1-1	W	X	C	F	2D	2
244	RB-9B-1-1	X	X	C	X	7D	7
245	RB-9B-1-1	X	X	O	X	19D	19
246	RB-9B-1-1	G	R	C	X	1D	5
247	RB-9B-1-1	W	R	C	G	2D	2
248	RB-9B-1-1	K	C	C	X		1
249	RB-9B-1-1	W	R	C	X	8D	35
250	RB-9B-1-1	X	X	I	X	1D	1
251	RB-9B-1-1	M	C	C	X	3D	3
252	RB-9B-1-1	W	C	C	X		3
253	RB-9B-1-1	W	C	O	X		1
254	RB-9B-1-1	W	N	O	X		1
255	RB-3B-1-1	W	N	Z	X		4
256	RB-3B-1-1	W	R	C	X	1D	5
257	RB-3B-1-1	K	B	C	X		1
258	RB-3B-1-1	X	X	C	X	4D	4
259	RB-3B-1-1	W	A	C	X	1D	11
260	RB-3B-1-1	A	X	C	I	2D REBORDE BASAL	3
261	RB-3B-1-1	W	B	C	X		4
262	RB-3B-1-1	A	X	C	X		10
263	RB-3B-1-1	W	X	C	X		13
264	RB-3B-1-1	A	X	C	X	2D	7
265	RB-3B-1-1	X	X	C	L		6
266	RB-3B-1-1	X	X	C	S		6
267	RB-3B-1-1	X	X	C	X	1D	194
268	RB-3B-2-3	K	B	C	X		1
269	RB-3B-2-3	W	R	O	X		1
270	RB-3B-2-3	K	N	C	X	2D	7
271	RB-3B-2-3	X	X	O	L		4
272	RB-3B-2-3	X	X	O	X	7D	7
273	RB-3B-2-3	W	X	C	X		33
274	RB-16A-1-3	W	X	C	X		17
275	RB-16A-1-3	W	X	O	X	1D	2
276	RB-16A-1-3	X	X	O	X		36
277	RB-16A-1-3	W	C	C	X	1D	2
278	RB-16A-1-3	W	A	C	X		3
279	RB-16A-1-3	W	N	C	X		4
280	RB-16A-1-3	W	N	O	X		1
281	RB-16A-1-3	W	X	C	X		1
282	RB-16A-1-3	W	X	C	I		1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
283	RB-9B-1-1	W	N	C	X	4D	10
284	RB-9B-1-1	W	H1	C	X		4
285	RB-3B-1-3	W	R	C	X	3D	13
286	RB-3B-1-3	W	N	C	X		14
287	RB-3B-1-3	W	B	C	X		1
288	RB-3B-1-3	W	C	C	X		1
289	RB-3B-1-3	X	X	X	X		275
290	RB-3B-1-3	X	X	C	X	4D	4
291	RB-3B-1-3	X	X	O	X	15D	15
292	RB-3B-1-3	P	C	C	B	1D	1
293	RB-3B-1-3	W	X	X	X	4D	4
294	RB-3B-1-3	X	X	O	L		15
295	RB-3B-1-3	X	X	O	S		32
296	RB-3B-1-3	A	N	X	S	6D	6
297	RB-3B-1-3	A	X	X	X		3
298	RB-3B-1-3	X	X	C	I		1
299	RB-3B-1-3	K	R	X	X		2
300	RB-1J-1-2	X	X	X	X		1
301	RB-1J-1-2	X	X	O	X	1D	1
302	RB-1J-1-2	X	X	C	X	3D	3
303	RB-1J-1-2	W	X	X	X	3D	34
304	RB-1J-1-2	X	X	O	X		9
305	RB-1J-1-2	W	N	O	X		2
306	RB-1J-1-2	W	R	C	X	1D	7
307	RB-1J-1-2	A	X	X	X	3D	7
308	RB-1J-1-5	W	H3	C	X		14
309	RB-1J-1-5	W	N	C	F		4
310	RB-1J-1-5	W	H1	C	X		7
311	RB-1J-1-5	W	H4	C	X		1
312	RB-1J-1-1	X	X	X	X		52
313	RB-1J-1-1	X	X	O	X	2D	2
314	RB-1J-1-1	X	X	C	X	2D	2
315	RB-1J-1-1	X	X	Z	X	1D	1
316	RB-1J-1-1	M	C	C	X	1D BASE CREMA	1
317	RB-1J-1-1	M	N	C	F	1D BASE CREMA	1
318	RB-1J-1-1	W	R	C	X	1D	12
319	RB-1J-1-1	W	B	C	X		8
320	RB-1J-1-1	W	M	C	X		6
321	RB-1J-1-1	A	X	C	X	1D	32
322	RB-1J-1-1	A	N	X	X		2
323	RB-1J-1-1	A	X	O	X	1D	8
324	RB-1J-1-1	X	X	O	L		7
325	RB-1J-1-1	X	X	O	X		4
326	RB-8A-5-2	X	X	X	X		32
327	RB-8A-5-2	OT	X	C	P		2
328	RB-8A-5-2	X	X	X	S		1
329	RB-8A-5-2	X	X	O	X	2D	2
330	RB-8A-5-2	X	X	C	X	2D	2

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
331	RB-3B-1-2	W	A	C	X		7
332	RB-3B-1-2	M	N	C	X	SILUETA	3
333	RB-3B-1-2	K	N	C	X		2
334	RB-3B-1-2	W	C	C	X		2
335	RB-3B-1-2	W	C	C	X	1D	1
336	RB-3B-1-2	W	X	C	F	1D	2
337	RB-3B-1-2	W	R	C	X	3D	37
338	RB-3B-1-2	P	R	C	X		2
339	RB-3B-1-2	G	X	C	X	1D	1
340	RB-3B-1-2	W	B	C	X		9
341	RB-3B-1-2	W	N	C	X		10
342	RB-3B-1-2	X	X	Z	L		49
343	RB-3B-1-2	X	X	O	S		19
344	RB-3B-1-2	X	X	O	X	8D	8
345	RB-3B-1-2	OT					1
346	RB-3B-1-2	X	X	O	X		350
347	RB-3B-1-2	W	X	C	X		28
348	RB-3B-1-2	G	X	C	X	EROSIONADO	60
349	RB-3B-1-2	A	X	C	X		60
350	RB-8A-5-2	X	X	Z	X	1D	1
351	RB-8A-5-2	K	N	C	X		1
352	RB-8A-5-2	M	B	C	X		2
353	RB-8A-5-2	W	C	C	X		1
354	RB-8A-5-2	W	N	C	X		4
355	RB-8A-5-2	W	X	X	X		29
356	RB-8A-5-2	W	X	C	F	1D	1
357	RB-8A-5-2	G	X	C	X	1D	2
358	RB-8A-5-2	A	X	X	X		8
359	RB-8A-5-2	W	R	C	X	3D	9
360	RB-8A-5-3	M	N	C	X		1
361	RB-8A-5-3	X	X	O	L		5
362	RB-8A-5-3	X	X	O	S		2
363	RB-8A-5-3	W	X	X	X		12
364	RB-8A-5-3	X	X	X	X		16
365	RB-8A-5-3	X	X	O	X	2D	2
366	RB-8A-5-3	W	N	C	X		1
367	RB-8A-5-3	G	R	C	X	3D	10
368	RB-8A-5-3	G	R	O	X		4
369	RB-9B-2-2	W	A	C	X		26
370	RB-9B-2-2	W	A	T	X	1D	6
371	RB-9B-2-2	W	A	C	I	1D	1
372	RB-9B-2-2	M	R	O	X	1D	1
373	RB-1J-1-3	X	X	O	X	12D	168
374	RB-1J-1-3	X	X	CZ	X	2D	16
375	RB-1J-1-3	X	X	O	L		14
376	RB-1J-1-3	X	X	T	X	1D	1
377	RB-1J-1-3	X	X	O	S		50
378	RB-1J-1-3	W	X	C	X	3D	43

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
379	RB-1J-1-3	M	N	C	X	1D	3
380	RB-1J-1-3	K	N	C	X		1
381	RB-1J-1-3	W	B	C	X		1
382	RB-1J-1-3	W	R	C	X	3D	45
383	RB-1J-1-3	W	H4	C	X	1D	1
384	RB-1J-1-3	W	A	C	X	4D	15
385	RB-1J-1-3	M	B	C	X		7
386	RB-1J-1-3	W	X	C	X	4D	4
387	RB-1J-1-3	X	X	O	X		6
388	RB-3B-1-2	A	X	C	X		4
389	RB-3B-1-2	X	X	C	X		1
390	RB-3B-1-2	A	X	C	X		1
391	RB-3B-1-2	OT					1
392	RB-1J-1-4	X	X	C	X		160
393	RB-1J-1-4	X	X	O	S		17
394	RB-1J-1-4	X	X	Z	L		1
395	RB-1J-1-4	X	X	O	X	3D	3
396	RB-1J-1-4	X	X	Z	X	2D	2
397	RB-1J-1-4	W	A	C	X		2
398	RB-1J-1-4	K	C	C	X		1
399	RB-1J-1-4	M	N	C	X		2
400	RB-1J-1-4	W	H1	C	X		1
401	RB-1J-1-4	W	C	C	X	1D	4
402	RB-1J-1-4	W	B	C	X		3
403	RB-1J-1-4	W	R	C	R	1D	1
404	RB-1J-1-4	W	R	C	X	3D	43
405	RB-1J-1-4	W	N	C	X	2D	16
406	RB-1J-1-4	W	N	C	F	2D	2
407	RB-1J-1-5	K	B	C	B	3D	3
408	RB-1J-1-5	W	N	C	X	1D	19
409	RB-1J-1-5	K	H1	C	X		2
410	RB-1J-1-5	W	R	O	X		10
411	RB-1J-1-5	W	X	X	X		21
412	RB-1J-1-5	M	R	C	X	4D	4
413	RB-1J-1-5	X	X	X	X		60
414	RB-1J-1-5	X	X	O	X	5D	5
415	RB-1J-1-5	W	R	C	X	8D	28
416	RB-1J-1-5	W	A	O	X	1D	4
417	RB-1J-1-5	R	H1	C	X	1D	2
418	RB-1J-1-5	W	A	C	X	3D	7
419	RB-1J-1-5	W	B	O	L	1D	1
420	RB-1J-1-5	X	X	X	L		4
421	RB-1J-1-5	W	C	C	X	5D	15
422	RB-1J-1-5	K	R	O	X		3
423	RB-1J-1-5	OT					1
424	RB-8A-3-3	X	X	X	X		57
425	RB-8A-3-3	X	X	O	X	3D	3
426	RB-8A-3-3	W	N	C	X	2D	10

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
427	RB-8A-3-3	W	B	C	X		4
428	RB-8A-3-3	K	B	X	X	1D	1
429	RB-8A-3-3	K	B	C	R	1D	1
430	RB-8A-3-3	W	H1	C	X		7
431	RB-8A-3-3	X	X	O	L		6
432	RB-8A-3-3	W	R	C	X	3D	14
433	RB-8A-3-3	W	R	O	X		5
434	RB-8A-3-3	W	X	X	X		24
435	RB-8A-3-3	W	H1	X	F	2D	2
436	RB-8A-3-3	G	R	C	X	2D	2
437	RB-8A-3-3	W	C	C	X		3
438	RB-8A-9-1	X	X	X	X		26
439	RB-8A-9-1	X	X	O	X	2D	2
440	RB-8A-9-1	W	X	X	X	1D	9
441	RB-8A-9-1	X	X	X	G		1
442	RB-8A-9-1	X	X	X	L		2
443	RB-8A-9-1	M	C	C	X		1
444	RB-8A-9-1	W	H3	C	X		2
445	RB-8A-9-1	W	R	C	X		1
446	RB-8A-11-4	X	X	C	X		41
447	RB-8A-11-4	X	X	X	X	1D	2
448	RB-8A-11-4	X	X	O	X	1D	2
449	RB-8A-11-4	X	X	C	L		1
450	RB-8A-11-4	W	C	X	X		1
451	RB-8A-11-4	A	X	C	X		2
452	RB-8A-11-4	W	X	O	X		8
453	RB-8A-11-4	W	R	C	X	6D REBORDE BASAL	20
454	RB-8A-11-4	W	R	C	X	1D	5
455	RB-8A-11-4	M	R	O	X		8
456	RB-8A-11-4	S	A	C	X		1
457	RB-8A-11-4	M	A	C	X		1
458	RB-8A-11-4	W	A	C	X	1D	5
459	RB-8A-11-4	W	N	C	X	1D	15
460	RB-8A-11-4	W	B	C	X		6
461	RB-8A-11-4	W	B	O	X	2D	2
462	RB-8A-11-4	M	B	C	X	1D	4
463	RB-8A-10-2	X	X	X	X		33
464	RB-1J-1-4	G	X	C	X		4
465	RB-1J-1-4	A	X	C	X		45
466	RB-1J-1-4	W	X	C	X		22
467	RB-1J-1-4	A	X	C	X	2D	2
468	RB-1J-1-4	OT					6
469	RB-8A-10-1	X	X	O	X		70
470	RB-8A-10-1	X	X	X	L		4
471	RB-8A-10-1	W	R	C	X		5
472	RB-8A-10-1	W	N	C	X		3
473	RB-8A-10-1	A	N	C	X		5
474	RB-8A-10-1	A	X	O	X	25D	25

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
475	RB-8A-10-1	X	X	A	X	FIGURILLA	1
476	RB-8A-11-2	X	X	C	X		10
477	RB-8A-11-2	W	X	C	X		2
478	RB-8A-11-2	X	R	X	L	3D	3
479	RB-8A-11-2	W	A	C	X		3
480	RB-8A-11-2	G	X	C	X		3
481	RB-8A-11-2	X	X	C	L		2
482	RB-8A-4-2	X	X	O	X		15
483	RB-8A-10-2	X	X	C	X	1D	1
484	RB-8A-10-2	X	X	O	S		3
485	RB-8A-10-2	X	X	O	L		2
486	RB-8A-10-2	A	X	C	X		1
487	RB-8A-10-2	W	X	C	X		12
488	RB-8A-10-2	W	C	C	X	1D	1
489	RB-8A-10-2	W	H1	C	X		1
490	RB-8A-10-2	W	N	C	X	1D	6
491	RB-8A-10-2	W	R	C	X	1D	8
492	RB-8A-10-2	W	B	C	X	2D	2
493	RB-8A-10-2	W	A	C	X		1
494	RB-8A-10-2	M	B	C	X		1
495	RB-8A-10-2	M	R	C	X		1
496	RB-8A-6-4	X	X	X	X		16
497	RB-8A-6-4	X	X	C	S		1
498	RB-8A-6-4	W	C	C	X	1D	1
499	RB-8A-6-4	A	X	C	X		1
500	RB-8A-6-4	W	N	C	I		1
501	RB-8A-6-4	W	N	C	I	3D	7
502	RB-1J-1-3	W	C	T	X		9
503	RB-1J-1-3	K	N	C	X		3
504	RB-1J-1-3	W	X	C	X		1
505	RB-1J-1-3	W	H4	C	X		1
506	RB-1J-1-3	M	B	C	X		1
507	RB-1J-1-3	W	N	C	X		19
508	RB-1J-1-3	W	H2	C	X		2
509	RB-1J-1-3	A	X	O	X		8
510	RB-1J-1-3	A	N	C	L	1D	1
511	RB-1J-1-3	G	R	C	X		6
512	RB-1J-1-3	G	X	C	X		4
513	RB-1J-1-3	X	X	O	L		5
514	RB-1J-1-3	A	X	O	X	4D	22
515	RB-8A10-3	W	R	C	X		5
516	RB-8A10-3	X	X	X	L		1
517	RB-8A10-3	W	X	C	X		2
518	RB-8A10-3	X	X	O	X		30
519	RB-8A10-3	X	X	O	S		12
520	RB-8A10-3	A	N	O	X		3
521	RB-8A-6-4	W	X	C	X	2D	13
522	RB-8A-6-4	K	B	C	X		1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
523	RB-8A-6-4	W	R	C	R	1D	1
524	RB-8A-6-4	W	B	C	X		1
525	RB-8A-6-4	W	B	C	F	1D	1
526	RB-8A-6-4	M	R	C	X	1D	1
527	RB-8A-6-4	W	R	C	X	1D	9
528	RB-8A-6-4	M	B	C	X	1D	1
529	RB-8A-6-4	W	A	C	X	1D	1
530	RB-8A-6-4	W	A	C	F	1D	1
531	RB-8A-3-1	X	X	X	X		33
532	RB-8A-3-1	X	X	C	X	2D	2
533	RB-8A-3-1	X	X	O	X	2D	2
534	RB-8A-3-1	X	X	O	L		1
535	RB-8A-3-1	W	X	C	X		3
536	RB-8A-3-1	W	H2	C	X		1
537	RB-8A-3-1	W	N	C	X		1
538	RB-8A-3-1	M	R	C	X		1
539	RB-8A-3-1	M	N	C	X		1
540	RB-8A-10-3	W	R	T	X	2D	2
541	RB-8A-10-3	W	R	C	X		9
542	RB-8A-10-3	W	R	C	I	1D	1
543	RB-8A-10-3	G	B	O	X		2
544	RB-8A-10-3	G	N	C	X		10
545	RB-8A-4-2	W	B	C	X		1
546	RB-8A-4-2	X	X	C	L		4
547	RB-8A-4-2	K	N	C	X		2
548	RB-8A-4-2	W	R	C	X		15
549	RB-8A-4-2	G	X	X	X		11
550	RB-8A-4-2	A	X	X	X		8
551	RB-8A-12-2	W	N	C	F	1D	1
552	RB-8A-12-2	X	X	O	X	3D	3
553	RB-8A-12-2	X	X	C	X		40
554	RB-8A-12-2	X	X	C	L		5
555	RB-8A-12-2	X	X	C	G	1D	1
556	RB-8A-12-2	W	R	C	X		8
557	RB-8A-12-2	W	H3	C	X		1
558	RB-8A-12-2	W	X	X	X		5
559	RB-8A-5-3	G	X	X	X		3
560	RB-8A-9-3	X	X	X	X		17
561	RB-8A-9-3	W	X	X	X		1
562	RB-8A-9-3	W	R	C	X		3
563	RB-8A-9-3	W	R	O	X	1D	1
564	RB-8A-9-3	X	X	O	I		5
565	RB-8A-9-3	W	N	O	X		2
566	RB-8A-9-3	X	X	C	X	1D	1
567	RB-8A-9-3	W	R	C	G	1D	1
568	RB-8A-2-3	W	N	C	X		2
569	RB-8A-2-3	G	N	C	I	1D	1
570	RB-8A-2-3	W	R	O	X		2

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
571	RB-8A-2-3	X	X	O	S		2
572	RB-8A-2-3	M	R	O	X		1
573	RB-8A-2-3	X	X	X	X		16
574	RB-8A-2-3	W	H1	C	X		1
575	RB-8A-2-3	M	H1	C	X	2D	3
576	RB-8A-2-3	G	R	C	X	2D	3
577	RB-8A-2-3	W	R	C	X		3
578	RB-8A-3-1	A	X	C	X	1D REBORDE BASAL	2
579	RB-8A-3-1	W	B	C	X	1D	4
580	RB-8A-3-1	W	R	C	X		5
581	RB-8A-13-2	X	X	X	X		34
582	RB-8A-13-2	X	X	O	S		10
583	RB-8A-13-2	X	X	O	L		3
584	RB-8A-13-2	W	X	C	X	3D	22
585	RB-8A-13-2	A	X	C	X		3
586	RB-8A-13-2	W	N	C	X		5
587	RB-8A-13-2	K	R	C	G		1
588	RB-8A-13-2	K	N	C	X	1D	1
589	RB-8A-13-2	K	B	C	X		1
590	RB-8A-13-2	W	B	C	X		1
591	RB-8A-13-2	W	R	C	X	2D	7
592	RB-8A-13-2	W	H1	C	X	1D	2
593	RB-8A-13-1	X	X	X	X		38
594	RB-8A-13-1	X	X	O	S		2
595	RB-8A-13-1	X	X	O	L		1
596	RB-8A-13-1	A	X	Z	X	1D	1
597	RB-8A-2-3	W	R	C	F	1D	1
598	RB-8A-2-3	W	C	C	X		4
599	RB-8A-2-3	W	H4	C	X	1D	1
600	RB-8A-2-3	M	R	C	X	2D	2
601	RB-8A-6-2	K	C	C	X		4
602	RB-8A-6-2	W	R	C	X	2D	2
603	RB-8A-6-2	X	A	O	L		2
604	RB-8A-6-2	W	X	X	X		5
605	RB-8A-6-2	X	X	X	X		16
606	RB-8A-6-2	X	X	O	X	1D	1
607	RB-8A-13-2	X	X	X	X		7
608	RB-8A-14-3	W	N	C	X		1
609	RB-8A-14-3	W	R	O	X		2
610	RB-8A-14-3	W	R	C	X		3
611	RB-8A-14-3	W	X	X	X		2
612	RB-8A-14-3	X	X	O	L		2
613	RB-8A-14-3	X	X	X	X		2
614	RB-8A-14-3	X	X	O	X	1D	1
615	RB-8A-14-1	W	X	X	X		7
616	RB-8A-12-2	W	B	X	X		5
617	RB-8A-12-2	A	X	X	X		6
618	RB-8A-12-2	M	H2	C	X	1D	1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
619	RB-8A-12-2	G	X	X	X		8
620	RB-8A-12-2	X	X	A	X		1
621	RB-8A-2-2	X	X	C	X	1D	34
622	RB-8A-2-2	X	X	C	I	1D	1
623	RB-8A-2-2	X	X	X	L		5
624	RB-8A-2-2	W	B	C	X	1D	1
625	RB-8A-2-2	W	R	C	F	1D	1
626	RB-8A-2-2	W	C	C	X	1D	1
627	RB-8A-2-2	K	C	C	X		2
628	RB-8A-2-2	W	R	C	X		13
629	RB-8A-2-2	M	H1	C	G	1D	1
630	RB-8A-2-2	M	H1	C	X		1
631	RB-8A-2-2	K	N	C	X	1D	1
632	RB-8A-2-2	W	N	C	X		3
633	RB-8A-2-2	A	X	C	X	1D	3
634	RB-8A-2-2	G	X	X	X		8
635	RB-8A-14-1	W	R	O	X	1D	3
636	RB-8A-14-1	W	R	C	X		1
637	RB-8A-14-1	W	C	C	X	1D	1
638	RB-8A-12-2	W	N	C	D	1D	1
639	RB-8A-11-3	W	R	C	X	2D	7
640	RB-8A-11-3	W	R	C	F		1
641	RB-8A-11-3	W	C	O	X		1
642	RB-8A-11-3	W	N	C	X	1D	2
643	RB-8A-11-3	X	X	O	L		6
644	RB-8A-11-3	X	X	O	S		1
645	RB-8A-11-3	X	X	X	X		17
646	RB-8A-11-3	X	X	O	X	1D	1
647	RB-8A-11-3	G	R	C	X		1
648	RB-8A-11-3	G	X	X	X	1D	5
649	RB-8A-12-5	X	X	O	L		1
650	RB-8A-12-5	W	X	X	X		4
651	RB-8A-12-5	M	C	C	X		1
652	RB-8A-12-5	M	R	O	X		1
653	RB-8A-12-5	W	B	C	X		1
654	RB-8A-13-1	A	X	C	X		2
655	RB-8A-13-1	W	X	C	X		9
656	RB-8A-13-1	W	R	C	X		1
657	RB-8A-3-2	X	X	O	X	9D	100
658	RB-8A-3-2	X	X	O	I	1D	1
659	RB-8A-3-2	X	X	Z	X	1D	1
660	RB-8A-3-2	X	X	O	S		16
661	RB-8A-3-2	X	X	O	L		2
662	RB-8A-3-2	G	X	C	I	1D	2
663	RB-8A-3-2	G	X	C	X	1D BASE ANULAR	8
664	RB-8A-3-2	W	N	C	I	1D	1
665	RB-8A-3-2	W	N	C	X	1D	24
666	RB-8A-3-2	M	B	C	X		3

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
667	RB-8A-3-2	G	A	C	X	2D	7
668	RB-8A-3-2	W	X	C	X		7
669	RB-8A-3-2	W	R	C	X	3D	17
670	RB-8A-3-2	W	A	C	X		2
671	RB-8A-3-2	W	R	T	X	1D	1
672	RB-1F-1-2	X	X	C	X	5D	5
673	RB-8A-6-3	X	X	C	A	1D	1
674	RB-8A-6-3	W	B	C	X	1D	1
675	RB-8A-6-3	W	R	C	X	4D	9
676	RB-8A-6-3	W	R	C	X		2
677	RB-8A-6-3	A	R	O	X		13
678	RB-8A-6-3	X	X	O	X		16
679	RB-8A-6-3	W	N	C	X	1D	6
680	RB-8A-6-3	W	X	C	X		6
681	RB-8A-6-3	X	X	O	S		11
682	RB-8A-6-3	P	A	C	X	1D POLICROMIA	1
683	RB-8A-5-1	W	R	O	X	1D	1
684	RB-8A-5-1	W	N	C	X		1
685	RB-8A-5-1	OT				1D	1
686	RB-8A-5-1	X	X	O	X		4
687	RB-8A-5-1	W	R	C	X		3
688	RB-8A-5-1	W	X	C	X		2
689	RB-8A-5-1	G	X	C	X		1
690	RB-8A-5-1	W	B	C	X		1
691	RB-1F-1-1	X	X	O	A	1D	1
692	RB-8A-9-2	W	N	C	X		1
693	RB-8A-9-2	W	X	C	I		1
694	RB-8A-9-2	M	N	C	X	1D	4
695	RB-8A-9-2	W	X	X	X		22
696	RB-8A-7-2	X	X	O	X		70
697	RB-8A-7-2	W	N	C	X		5
698	RB-8A-7-2	W	B	C	X		1
699	RB-8A-7-2	X	X	O	S		19
700	RB-8A-7-2	W	X	C	X		26
701	RB-8A-7-2	G	N	C	X		1
702	RB-8A-7-2	A	X	C	X		8
703	RB-8A-7-2	M	N	C	X		1
704	RB-8A-7-2	A	X	C	I	1D	1
705	RB-8A-7-2	W	R	C	X	2D	2
706	RB-8A-7-2	W	H1	C	X		1
707	RB-8A-7-2	G	X	C	X	1D	1
708	RB-8A-7-2	A	X	X	X		4
709	RB-8A-4-4	M	C	O	X		3
710	RB-8A-4-4	W	R	C	X	1D	9
711	RB-8A-12-4	W	N	C	X	1D	5
712	RB-8A-12-4	W	C	C	X	1D	3
713	RB-8A-12-4	M	R	C	X		1
714	RB-8A-12-4	M	R	C	G	1D	1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
715	RB-8A-12-4	K	R	C	R	1D	1
716	RB-8A-12-4	W	H2	C	X		1
717	RB-8A-12-4	K	C	O	X		1
718	RB-8A-12-4	W	R	O	X		2
719	RB-8A-12-4	W	R	C	X	2D	6
720	RB-8A-12-4	X	X	X	X		6
721	RB-8A-12-4	X	X	O	X	1D	1
722	RB-8A-12-4	W	X	X	X		3
723	RB-1J-2-2	W	X	X	X		12
724	RB-1J-2-2	W	N	C	X		2
725	RB-8A-10-3	X	X	X	X		15
726	RB-8A-10-3	X	X	O	X	1D	1
727	RB-8A-10-3	W	N	C	X	1D	3
728	RB-8A-10-3	W	X	X	X		7
729	RB-8A-10-3	W	R	C	X		4
730	RB-8A-10-3	X	X	O	S		7
731	RB-8A-10-3	G	N	C	X		1
732	RB-8A-10-2	X	X	X	X		54
733	RB-8A-10-2	X	X	C	X	1D	1
734	RB-8A-10-2	W	X	X	X		3
735	RB-8A-10-2	W	X	C	G	1D	1
736	RB-8A-10-2	G	X	X	X		5
737	RB-8A-10-2	W	H1	C	X	1D	2
738	RB-8A-10-2	W	R	C	X	1D	3
739	RB-8A-10-2	W	B	O	X	2D	2
740	RB-8A-10-2	W	B	C	F	1D	1
741	RB-8A-10-2	X	X	O	L		1
742	RB-8A-10-2	W	N	O	X		3
743	RB-8A-10-2	W	N	C	X		4
744	RB-8A-10-2	M	H2	C	X		7
745	RB-8A-7-3	X	X	X	X		145
746	RB-8A-7-3	X	X	O	X	7D	7
747	RB-8A-7-3	A	X	C	X	9D	9
748	RB-8A-7-3	W	X	X	X		16
749	RB-8A-7-3	W	A	C	X	1D	5
750	RB-8A-7-3	S	R	C	X		1
751	RB-8A-7-3	W	R	C	X	1D	5
752	RB-8A-7-3	W	B	O	X		2
753	RB-8A-7-3	X	X	O	S	1D	49
754	RB-8A-7-3	W	H1	C	X		1
755	RB-8A-7-3	W	N	C	X		4
756	RB-8A-7-3	G	R	C	X		6
757	RB-8A-7-3	G	X	X	X	2D	7
758	RB-8A-7-3	M	C	C	X		1
759	RB-8A-7-3	M	N	C	X	1D	5
760	RB-8A-7-3	M	R	C	X	1D	7
761	RB-8A-7-3	M	A	O	X		3
762	RB-1F-1-1	X	X	O	G	1D	93

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
763	RB-1F-1-1	X	X	O	X	18D	18
764	RB-1F-1-1	X	X	X	X	4D	210
765	RB-1F-1-1	W	X	X	X		10
766	RB-1F-1-1	G	X	X	X		4
767	RB-1F-1-1	A	X	X	X		60
768	RB-8A-4-4	W	R	O	X		5
769	RB-8A-14-4	X	X	X	X		14
770	RB-8A-14-4	X	X	O	L		6
771	RB-8A-14-4	M	N	C	X	2D	6
772	RB-8A-14-4	W	R	O	X		3
773	RB-8A-14-4	W	R	C	X		7
774	RB-8A-14-4	M	C	C	X		3
775	RB-8A-14-4	M	R	C	X		4
776	RB-8A-14-4	W	B	C	X	1D	3
777	RB-8A-14-4	K	R	C	X		1
778	RB-8A-14-4	W	R	C	H	5D	5
779	RB-8A-7-1	X	X	X	X		18
780	RB-8A-7-1	X	X	O	X	5D	5
781	RB-8A-7-1	W	H1	C	X	2D	2
782	RB-8A-7-1	X	X	O	L		3
783	RB-8A-7-1	W	X	X	X		2
784	RB-8A-7-1	W	R	C	X	4D	6
785	RB-8A-7-1	A	X	X	X		3
786	RB-8A-7-1	W	N	C	X	2D	2
806	RB-1F-1-6	X	X	O	X	MIDDLE PRE	1
807	RB-1F-1-6	X	X	O	X		17
808	RB-1F-1-6	X	X	O	S	1D	5
809	RB-1F-1-6	X	X	CZ	X	2D	2
810	RB-1F-1-6	X	X	O	I		2
811	RB-1F-1-6	W	R	C	X		2
812	RB-1F-1-6	W	N	C	X		1
813	RB-1F-1-6	A	X	O	X	1D	4
814	RB-1F-1-6	A	X	O	X		2
815	RB-1F-1-6	G	N	C	X		1
816	RB-1F-1-6	G	X	C	X		1
817	RB-1F-1-6	A	X	O	S	1D	1
818	RB-1F-1-4	X	X	O	X		35
819	RB-1F-1-4	X	X	O	S		6
820	RB-1F-1-4	A	X	C	X	1D BAÑO BLANCO	1
821	RB-1F-1-4	P	P	C	P	1D POLICROMIA	1
822	RB-1F-1-4	G	X	C	X	1D	2
823	RB-1F-1-4	A	X	C	X	1D	1
824	RB-1F-1-4	A	X	O	X		10
825	RB-1F-1-2	W	B	X	X		1
826	RB-1F-1-2	W	R	C	X		5
827	RB-1F-1-2	A	X	C	X		19
828	RB-1F-1-2	K	H1	C	X		1
829	RB-1F-1-2	M	N	C	X		1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
830	RB-1F-1-2	A	X	C	X	6D	6
831	RB-1F-1-2	W	X	C	X		15
832	RB-1F-1-2	A	X	C	X	2D	50
833	RB-1F-1-2	G	X	C	X	2D	14
834	RB-1F-1-2	A	X	C	X	1D	1
835	RB-1F-1-2	X	X	A	X	ARTEFACTO N/I	1
836	RB-1F-1-2	W	B	C	X	2D	2
837	RB-1F-1-2	X	X	O	S		144
838	RB-1F-1-2	X	X	O	S		6
839	RB-1F-1-2	X	X	I	A		1
840	RB-1F-1-2	X	X	C	I		1
841	RB-1F-1-2	A	A	C	X		1
842	RB-1F-1-2	W	W	O	X		1
843	RB-1F-1-2	X	X	O	X		9
844	RB-1F-1-3	X	X	X	G		46
845	RB-1F-1-3	X	X	X	X		70
846	RB-1F-1-3	W	N	C	X	2D	6
847	RB-1F-1-3	X	X	O	X	3D	3
848	RB-1F-1-3	W	B	C	X	3D	7
849	RB-1F-1-3	W	B	O	X		1
850	RB-1F-1-3	G	X	X	X	1D	5
851	RB-1F-1-3	M	N	O	X		5
852	RB-1F-1-3	M	R	C	X		4
853	RB-1F-1-3	A	X	X	X	1D	10
854	RB-8A-4-4	X	X	X	X		9
855	RB-8A-4-4	X	X	O	X	2D	2
856	RB-8A-4-4	X	X	O	L		3
857	RB-8A-4-4	W	X	X	X		7
858	RB-8A-4-4	M	R	C	X	1D	1
859	RB-8A-4-4	W	N	C	X	1D	1
860	RB-8A-4-4	W	R	C	D	1D	1
861	RB-8A-4-4	W	R	C	F	1D	1
862	RB-8A-4-4	M	C	C	L	1D	1
863	RB-1F-1-5	X	X	O	X		6
864	RB-1F-1-5	G	B	C	X	1D	1
865	RB-1F-1-5	A	N	O	X	1D	1
866	RB-1F-1-5	X	X	O	S		1
867	RB-1F-1-4	W	R	C	G	1D	1
868	RB-1F-1-4	W	X	X	X		3
869	RB-8A-7-5	W	N	C	X	1D	5
870	RB-8A-7-4	X	X	O	X		2
871	RB-8A-7-4	W	X	C	X		1
872	RB-8A-7-4	W	R	C	X	1D	1
873	RB-8A-14-2	X	X	X	X		7
874	RB-8A-14-2	X	X	O	L		1
875	RB-8A-14-2	W	N	C	G	1D	2
876	RB-8A-14-2	G	X	X	X		6
877	RB-8A-14-2	W	R	C	X	1D	2

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
878	RB-8A-12-1	X	X	X	X		9
879	RB-8A-12-1	W	N	C	X	1D	5
880	RB-8A-12-1	W	X	C	X		5
881	RB-8A-12-1	W	R	C	X		3
882	RB-1F-1-2	X	X	Z	X	13D	13
883	RB-1F-1-2	X	X	O	X		475
884	RB-8A-4-1	OT				1D	1
885	RB-8A-4-1	X	X	O	X	1D OLLA TERMINAL	1
886	RB-8A-4-1	X	X	O	X		6
887	RB-8A-4-1	W	X	C	X	2D	9
888	RB-8A-4-1	W	N	C	X		1
889	RB-8A-4-1	W	R	C	X		1
890	RB-8A-4-1	W	R	C	X		1
891	RB-8A-4-1	W	H1	C	X		1
892	RB-8A-7-5	W	B	C	X		3
893	RB-8A-7-5	W	A	C	X	1D	4
894	RB-8A-7-5	W	H2	C	X	1D	1
895	RB-8A-7-5	W	H1	C	X		2
896	RB-8A-7-5	W	R	O	X		2
897	RB-8A-7-5	K	R	C	X		1
898	RB-8A-7-5	W	X	X	X		2
899	RB-8A-7-5	W	R	C	X		5
900	RB-8A-7-5	X	X	X	X		12
901	RB-8A-9-2	A	R	C	X		1
902	RB-8A-9-2	X	X	X	X		8
903	RB-8A-9-2	X	X	C	S		11
904	RB-8A-9-2	X	X	X	L		1
905	RB-8A-9-2	G	X	C	X		9
906	RB-8A-9-2	A	X	C	X		2
907	RB-8A-9-2	X	X	X	X		60
908	RB-8A-9-2	K	R	C	X		2
909	RB-8A-9-2	K	N	C	X	1D	1
910	RB-8A-9-2	W	B	C	X		1
911	RB-8A-9-2	W	R	C	X		6
912	RB-8A-9-2	W	R	O	X		1
913	RB-8A-9-2	W	A	C	X	1D	1
914	RB-8A-9-2	K	B	C	X		2
915	RB-8A-9-2	W	H1	X	X		1
916	RB-8A-9-2	W	N	C	X		8
917	RB-8A-9-2	W	B	C	X		1
918	RB-8A-9-2	W	N	C	G	3D	3
919	RB-8A-9-2	G	R	C	X	1D	1
920	RB-8A-12-1	W	R	C	F	2D	2
921	RB-8A-12-1	W	B	C	X		1
922	RB-8A-12-1	M	B	C	X		3
923	RB-8A-4-3	G	X	C	X	1D	1
924	RB-8A-4-3	W	N	C	X		2
926	RB-8A-4-3	W	X	C	X	1D	1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
927	RB-8A-4-3	W	R	C	X	2D	6
928	RB-8A-4-3	X	X	X	X		22
929	RB-8A-4-3	X	X	O	L		11
930	RB-8A-4-3	X	X	O	X	3D	3
931	RB-8A-12-3	X	X	X	X		4
932	RB-8A-12-3	X	X	C	X	1D	1
933	RB-8A-12-3	W	R	C	X	1D	1
934	RB-8A-12-3	X	X	O	S	1D	1
935	RB-8A-6-1	X	X	X	X		3
936	RB-8A-6-1	W	R	C	X	1D	3
937	RB-8A-6-1	W	C	C	X	1D	1
938	RB-8A-11-1	W	R	C	X		5
939	RB-8A-2-1	W	X	C	X	3D	16
940	RB-8A-2-1	G	X	C	X		1
941	RB-8A-2-1	W	N	C	X		1
942	RB-8A-2-1	W	C	C	X	1D	1
943	RB-8A-2-1	W	R	C	X	1D	7
944	RB-8A-2-1	X	X	O	X		13
945	RB-8A-10-9	W	R	C	X	3D	7
946	RB-8A-10-9	A	X	Z	X	1D CLASICO	1
947	RB-8A-10-9	M	R	C	X		1
948	RB-8A-10-9	X	X	O	S		3
949	RB-8A-10-9	A	X	O	X		3
950	RB-8A-10-9	X	X	O	X	1D	38
951	RB-8A-14-1	M	R	C	X	2D BASE ROJO	2
952	RB-8A-6-3	W	A	C	X		5
953	RB-8A-6-3	M	N	C	X		2
954	RB-8A-10-1	A	X	C	BA	1D	1
955	RB-8A-10-1	G	X	C	X		3
956	RB-8A-11-4	W	B	C	G	1D	1
957	RB-8A-11-3	W	R	C	X		2
958	RB-8A-5-4	X	X	O	X		54
959	RB-8A-5-4	X	X	C	L	1D	1
960	RB-8A-5-4	X	X	O	L		8
961	RB-8A-5-4	X	X	T	X		3
962	RB-8A-5-4	W	N	C	X		17
963	RB-8A-5-4	W	X	C	X		25
964	RB-8A-5-4	M	C	C	X		4
965	RB-8A-5-4	W	C	O	X	1D	1
966	RB-8A-5-4	G	A	C	X		2
967	RB-8A-5-4	W	R	C	X		7
968	RB-8A-5-4	W	A	C	X		4
969	RB-8A-5-4	W	B	C	G	1D	1
970	RB-8A-5-4	A	X	O	X	1D	1
971	RB-8A-5-4	W	R	C	X		3
972	RB-8A-5-4	M	R	C	X		3
973	RB-8A-5-4	M	N	C	I	1D	1
974	RB-8A-5-4	W	R	C	X		20

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
975	RB-8A-5-4	M	N	C	X	1D	1
976	RB-8A-5-4	W	H4	X	X		1
977	RB-11A-5-2	X	X	O	F	4D	18
978	RB-11A-5-2	X	X	O	X		285
979	RB-11A-5-2	X	X	T	A	2D	2
980	RB-11A-5-2	W	X	C	X	6D	121
981	RB-11A-5-2	W	X	O	X	1D	8
982	RB-11A-5-2	G	A	C	X	4D	4
983	RB-11A-5-2	M	A	C	X		10
984	RB-11A-5-2	M	A	T	X		4
985	RB-11A-5-2	W	A	T	X	1D	1
986	RB-11A-5-2	W	A	C	F	5D	5
987	RB-11A-5-2	W	R	C	P	1D	1
988	RB-11A-5-2	W	A	C	X	2D	12
989	RB-11A-5-2	A	R	T	X	1D	1
990	RB-11A-5-2	M	A	C	F	1D	1
991	RB-11A-5-2	W	R	C	F	4D	4
992	RB-11A-5-2	W	R	C	X	10D	78
993	RB-11A-5-2	W	X	T	I/P	1D	1
994	RB-11A-5-2	W	X	C	F	ESTUCO	1
995	RB-11A-5-2	K	N	C	X	3D	3
996	RB-8A-11-1	X	X	X	X		6
997	RB-8A-11-1	X	X	O	X	2D	2
998	RB-11A-5-7	K	C	C	X	3D	3
999	RB-11A-5-7	W	H4	C	I	2D	2
1000	RB-11A-5-7	W	X	C	I	1D	1
1001	RB-11A-5-7	K	R	C	R	1D	1
1002	RB-11A-5-7	K	N	C	R	1D	1
1003	RB-11A-5-7	X	X	X	X		2
1004	RB-11A-5-7	K	H4	X	X		1
1005	RB-11A-5-7	K	C	C	X		1
1006	RB-11A-5-7	W	N	C	X		2
1007	RB-11A-5-7	W	R	C	X		3
1008	RB-8A-5-4	W	H2	C	X	1D	1
1009	RB-8A-5-4	M	B	C	X		3
1010	RB-8A-5-4	W	H1	C	X	1D	1
1011	RB-8A-5-4	M	C	C	X	1D	1
1012	RB-8A-5-4	M	R	C	X	1D	4
1015	RB-8A-11-3	G	X	P	X	1D	1
1016	RB-8A-14-5	X	X	C	X		1
1017	RB-8A-14-5	W	R	C	X	2D	3
1018	RB-11A-5-1	G	N	C	D	1D	1
1019	RB-11A-5-1	X	X	C	L	ROMBOS	1
1020	RB-11A-5-1	X	X	X	X		183
1021	RB-11A-5-1	G	X	C	X	1D	1
1022	RB-11A-5-1	W	X	C	I	1D	1
1023	RB-11A-5-1	G	R	C	X		1
1025	RB-11A-5-1	W	R	C	F	2D	2

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
1026	RB-11A-5-1	X	X	O	X	6D	6
1027	RB-11A-5-1	X	X	O	L		8
1028	RB-11A-5-1	W	B	O	X		2
1029	RB-11A-5-1	W	B	C	X	1D	9
1030	RB-11A-5-1	K	N	C	X		2
1031	RB-11A-5-1	M	C	C	R	2D	2
1032	RB-11A-5-1	M	C	C	X	2D	12
1034	RB-11A-5-1	W	H4	C	X		1
1035	RB-11A-5-1	W	H1	C	X	2D	5
1036	RB-11A-5-1	W	N	C	X	9D	31
1037	RB-11A-5-1	M	R	C	X	1D	11
1038	RB-11A-5-1	M	N	C	X		3
1039	RB-11A-5-1	M	A	C	X	2D	8
1040	RB-11A-5-1	W	A	C	X		11
1041	RB-11A-5-1	W	C	C	X		1
1042	RB-11A-5-1	OT					1
1043	RB-11A-5-3	M	N	C	X	6D	8
1044	RB-11A-5-3	M	H1	C	X	1D	1
1045	RB-11A-5-3	W	A	C	X	5D	12
1046	RB-11A-5-3	M	A	C	R	2D	3
1047	RB-11A-5-3	M	A	O	X		1
1048	RB-11A-5-3	W	A	O	X	1D	3
1053	RB-11A-5-2	W	N	C	X	13D	32
1054	RB-11A-5-2	W	N	O-T	X		9
1055	RB-11A-5-2	W	N	VERTE	X	1D	1
1056	RB-11A-5-2	W	N	C	F	1D	1
1057	RB-11A-5-2	M	B	C	I	1D	1
1058	RB-11A-5-2	W	B	C	I	1D	1
1059	RB-11A-5-2	W	H1	C	X		6
1060	RB-11A-5-2	W	N/A	C	I	1D	1
1061	RB-11A-5-2	G	A	C	X	2D EARLY CLASSIC	3
1062	RB-11A-5-2	W	H5	C	X		2
1063	RB-11A-5-2	W	A	C	I		1
1064	RB-11A-5-2	K	A	C	X	5D	5
1065	RB-11A-5-2	W	C	C	X	6D	6
1066	RB-11A-5-2	M	C	C	X	6D	19
1067	RB-11A-5-2	W	B	C	X	1D	1
1068	RB-11A-5-2	M	B	O	X	2D	2
1069	RB-11A-5-2	M	B	C	X	4D	23
1070	RB-11A-5-2	M	R	T	X	1D	1
1071	RB-11A-5-2	M	C	C	MO	1D	1
1072	RB-11A-5-4	W	A	C	X	4D	22
1073	RB-11A-5-4	M	A	C	X	2D	7
1074	RB-11A-5-4	K	H2	C	X		1
1075	RB-11A-5-4	X	X	O	L		26
1076	RB-11A-5-4	OT			X	1D	1
1077	RB-11A-5-4	X	X	X	X		197
1078	RB-11A-5-4	X	X	O	X	20D	20

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
1079	RB-11A-5-4	X	X	C	X	10D	10
1080	RB-11A-5-4	W	X	C	X	7D	40
1081	RB-11A-5-4	W	X	C	G	1D	1
1082	RB-11A-5-4	W	N	C	X	3D	26
1083	RB-11A-5-4	W	N	O	X	2D	2
1084	RB-11A-5-4	W	R	C	X	13D	44
1085	RB-11A-5-4	W	R	O	X	1D	1
1086	RB-11A-5-4	W	R	C	G	1D	1
1087	RB-11A-5-4	W	C	C	X		4
1088	RB-11A-5-4	W	H1	C	X		1
1089	RB-11A-5-4	W	H6	C	I	1D	1
1090	RB-11A-5-4	K	R	C	X		1
1091	RB-11A-5-3	X	X	X	X		93
1092	RB-11A-5-3	X	X	O	L	2D	15
1093	RB-11A-5-3	X	X	O	X	9D	9
1094	RB-11A-5-3	W	X	X	X	2D	24
1095	RB-11A-5-3	W	X	C	I	1D	1
1096	RB-11A-5-3	W	X	O	D	1D	1
1097	RB-11A-5-3	W	H1	C	X		2
1098	RB-11A-5-3	W	H6	C	I	2D	2
1099	RB-11A-5-3	W	C	C	X	2D	4
1100	RB-11A-5-3	W	B	C	X	3D	6
1101	RB-11A-5-3	W	H2	C	B	1D	1
1102	RB-11A-5-3	W	R	O	X	1D	10
1103	RB-11A-5-3	M	R	C	G	1D	1
1104	RB-11A-5-3	W	N	O	X		4
1105	RB-11A-5-3	W	N	C	X	6D	9
1106	RB-11A-5-3	M	C	C	X		1
1107	RB-11A-5-3	M	N	O	X		2
1108	RB-11A-5-3	W	R	C	X		8
1109	RB-11A-5-3	M	R	C	X		12
1110	RB-11A-5-2	M	N	C	X	2D	21
1111	RB-11A-5-2	M	N	C	F	2D	2
1112	RB-11A-5-2	W	H6	C	F	1D	1
1113	RB-11A-5-2	M	N	O-T	X		5
1114	RB-11A-5-2	K	H1	C	X	7D	7
1115	RB-11A-5-2	K	R	C	X	1D	10
1116	RB-11A-5-2	K	B	C	X	2D	2
1117	RB-11A-5-2	W	H6	C	X	2D	2
1118	RB-11A-5-2	W	H4	C	X		2
1119	RB-11A-5-2	W	C	C	F	1D	1
1120	RB-11A-5-2	X	X	O	L	4D	4
1121	RB-11A-5-2	M	R	T	X		1
1122	RB-11A-5-2	R	H1	C	X	2D	2
1129	RB-11A-5-4	W	H6	C	X	1D	1
1130	RB-11A-5-4	M	R	C	X	7D	32
1131	RB-11A-5-4	W	C	C	X	5D	17
1132	RB-11A-5-4	M	C	C	X		1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
1133	RB-11A-5-4	M	C	C	G	3D	3
1134	RB-11A-5-4	M	B	C	X	6D	17
1135	RB-11A-5-4	K	H1	C	X		6
1136	RB-11A-5-4	K	R	C	F	1D	1
1137	RB-11A-5-4	K	H2	C	X		2
1138	RB-11A-5-4	K	N	C	X		1
1139	RB-11A-5-4	W	R	C	R		2
1140	RB-11A-5-4	K	H3	C	X		11
1148	RB-11A-5-6	X	X	O	X	4D	4
1149	RB-11A-5-6	W	N	C	G	1D	1
1150	RB-11A-5-6	W	R	C	X	2D	5
1151	RB-11A-5-6	M	N	C	X	4D	4
1152	RB-11A-5-6	K	N	C	X	1D	3
1153	RB-11A-5-6	W	B	C	I	1D	1
1154	RB-11A-5-6	W	X	X	X		6
1155	RB-11A-5-6	X	X	X	X		23
1156	RB-11A-5-5	W	R	C	X	5D	19
1157	RB-11A-5-6	K	N	C	X	1D	1
1158	RB-11A-5-7	X	X	O	X		2
1159	RB-11A-5-8	W	N	C	L	2D	2
1160	RB-11A-5-9	W	H1	C	I		1
1161	RB-11A-5-10	W	N	C	X		10
1162	RB-11A-5-11	W	X	X	X		11
1163	RB-11A-5-12	W	R	O	X		2
1164	RB-11A-5-13	X	X	O	X	6D	6
1165	RB-11A-5-14	X	X	X	X		59
1166	RB-11A-5-15	W	R	C	I	1D	1
1167	RB-11A-4-4	W	A	C	X	2D	2
1168	RB-11A-4-4	X	X	O	X	1D	5
1169	RB-11A-4-4	W	X	O/T	X		5
1170	RB-11A-4-4	X	X	O	I		1
1171	RB-11A-4-4	K	C	O	X	1D	1
1172	RB-11A-4-4	A	N	C	X	1D	1
1173	RB-11A-4-4	W	R	C	X		2
1174	RB-11A-4-4	W	N	C	X		1
1176	RB-11A-4-4	W	H2	C	X	1D	1
1177	RB-11A-4-1	K	C	C	X	1D	1
1178	RB-11A-4-3	X	X	O	X		5
1179	RB-11A-4-3	X	X	C	X		2
1180	RB-11A-4-3	G	N	C	X	1D	1
1181	RB-11A-4-3	W	X	O	X		1
1182	RB-11A-4-3	M	C	C	X		1
1183	RB-11A-4-3	M	A	C	X	1D	1
1184	RB-16A-1-4	W	H4	C	X	6D	6
1185	RB-16A-1-5	X	X	O	X		4
1186	RB-16A-1-6	W	X	C	X		2
1187	RB-16A-1-6	W	X	C	X		2
1188	RB-1F-1-2	G	X	C	X	1D PIE	1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
1189	RB-9B-2-4	X	X	X	X		2
1190	RB-9B-1-2	M	B	C	D	1D	1
1191	RB-14C-1-1	OT					1
1192	RB-11A-2-1	OT					1
1193	RB-14C-1-1	OT					1
1194	RB-11A-2-1	P	B	C	P	1D	1
1195	RB-8A-9-2	G	A	C	I	1D	1
1196	RB-1H-1-4	OT				1D	1
1197	RB-9B-2-3	X	X	I	X	1D	1
1198	RB-14A-1-2	G	X	C	I	1D GLIFO	1
1199	RB-11A-5-1	W	A	VERTE	X	1D	1
1200	RB-1G-1-3	W	H4	C	D	1D	1
1201	RB-17A-1-2	G	A	C	X	1D	1
1202	RB-17A-1-2	X	X	X	X		2
1203	RB-8A-5-1	G	X	C	X	1D BASE ANULAR	1
1204	RB-1J-2-1	X	X	O	X		1
2000	RB-7B-1-7	X	X	O	X		1
2001	RB-7B-1-7	W	A	O	X		3
2002	RB-7A-1-3	M	B	C	F	1D	1
2003	RB-7B-1-7	A	N	C	X	1D	1
2004	RB-7B-1-6	X	X	O	X	1D	20
2005	RB-7B-1-6	A	X	O	X	4D	11
2006	RB-7B-1-6	W	A	O/T	X	1D	5
2007	RB-7B-1-6	W	X	C	X	1D	12
2008	RB-7B-1-6	W	C	C	P	1D	1
2009	RB-7B-1-6	K	N	C	X	3D	5
2010	RB-7B-1-6	M	R	C	X	ROJO/NEGRO	3
2011	RB-7B-1-6	M	A	C	X	4D	4
2012	RB-7B-1-6	M	A	C	X	ROJO	1
2013	RB-7B-1-6	X	X	O	X	1D	6
2014	RB-7B-1-6	X	L	O	X		1
2015	RB-7B-1-6	W	A	T	X		1
2016	RB-7B-1-6	W	R	C	X		1
2017	RB-7B-1-6	W	A	C	X		1
2018	RB-7B-1-6	W	B	C	X		2
2019	RB-7B-1-5	W	N	T	G	1D	1
2020	RB-7B-1-5	W	H1	C	P	1D	1
2021	RB-7B-1-5	M	H2	C	X		3
2022	RB-7B-1-5	W	N	C	X		2
2023	RB-7B-1-5	W	X	X	X	2D	16
2024	RB-7B-1-5	A	X	X	X		1
2025	RB-7B-1-5	W	C	C	X	1D	3
2026	RB-7B-1-5	W	R	O	X		7
2027	RB-7B-1-5	W	X	X	I	1D	1
2028	RB-7B-1-5	W	R	C	X		6
2029	RB-7B-1-5	X	X	X	X		10
2030	RB-7B-1-5	X	X	O	X	2D	2
2031	RB-7B-1-4	W	X	C	I	1D	1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2032	RB-7B-1-4	M	R	C	X		1
2033	RB-7B-1-4	W	N	C	I	1D	1
2034	RB-7B-1-4	M	A	C	X		1
2035	RB-7B-1-4	W	A	C	X		1
2036	RB-7B-1-4	W	N	C	X		8
2037	RB-7B-1-4	W	H1	C	X		1
2038	RB-7B-1-2	W	X	X	X		11
2039	RB-7B-1-2	G	X	C	X	1D	1
2040	RB-7B-1-2	G	X	C	X	1D BASE	1
2041	RB-7B-1-2	X	X	X	X	3D	25
2042	RB-7B-1-2	W	N	C	X	1D	3
2043	RB-7B-1-2	W	R	C	X		4
2044	RB-7A-1-2	X	X	X	X	1D	50
2045	RB-7A-1-2	X	X	C	L		10
2046	RB-7A-1-2	W	X	C	X		12
2047	RB-7A-1-2	A	X	C	X	3D	3
2048	RB-7A-1-2	W	R	C	X		6
2049	RB-7A-1-2	W	N	C	X		4
2050	RB-7A-1-1	X	X	C	X	1D	12
2051	RB-9A-1-5	X	X	C	X		28
2052	RB-9A-1-5	X	X	C	L		3
2053	RB-9A-1-5	W	N	C	X		1
2054	RB-9A-1-5	W	R	C	X	1D	4
2055	RB-9A-1-5	M	H2	C	X		1
2056	RB-9A-1-5	W	X	X	X		6
2057	RB-7B-1-3	W	R	C	H	1D	1
2058	RB-7B-1-3	X	X	X	X		103
2059	RB-7B-1-3	X	X	O	X	2D	2
2060	RB-7B-1-3	X	X	C	X	2D	2
2061	RB-7B-1-3	X	X	Z	X	1D	1
2062	RB-7B-1-3	X	X	O	S		7
2063	RB-7B-1-3	X	X	O	L		11
2064	RB-7B-1-3	M	C	C	X	1D	2
2065	RB-7B-1-3	M	B	C	X		3
2066	RB-7B-1-3	M	N	C	X		1
2067	RB-7B-1-3	W	A	C	X	2D	13
2068	RB-7B-1-3	W	R	C	X	1D	8
2069	RB-7B-1-3	W	N	C	X	1D	10
2070	RB-7B-1-3	W	C	C	X		1
2071	RB-7B-1-3	W	H3	C	X		1
2072	RB-7B-1-3	G	X	C	X		2
2073	RB-7B-1-3	W	X	C	X		17
2074	RB-7B-1-3	A	X	C	X	1D	13
2075	RB-9A-1-3	X	X	X	X		41
2076	RB-7B-1-4	W	H6	C	X		1
2077	RB-7B-1-4	W	R	C	X		3
2078	RB-7B-1-4	X	X	O	L		5
2079	RB-7B-1-4	X	X	X	X		39

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2080	RB-7B-1-4	W	C	C	X	4D	8
2081	RB-7A-1-5	W	A	C	X	1D	2
2082	RB-7A-1-5	W	A	O	X		3
2083	RB-7A-1-5	W	R	O	X		4
2084	RB-7A-1-5	W	X	X	X		10
2085	RB-7A-1-5	M	A	C	G	1D	1
2086	RB-7A-1-5	M	N	C	X	1D	3
2087	RB-7A-1-5	M	H3	C	X		1
2088	RB-7A-1-5	W	N	O	X	1D	1
2089	RB-7A-1-5	W	R	C	R	2D	2
2090	RB-7A-1-5	X	X	O	L		7
2091	RB-7A-1-5	X	X	X	X		35
2092	RB-7A-1-5	M	H1	C	X		1
2093	RB-7A-1-5	X	X	O	X	2D	2
2094	RB-7A-1-4	W	H5	C	X	1D	1
2095	RB-9A-1-3	X	X	O	S		1
2096	RB-9A-1-3	X	X	C	X	3D	3
2097	RB-9A-1-3	W	X	C	X		7
2098	RB-9A-1-3	W	R	C	X		1
2099	RB-9A-1-4	X	X	C	X	1D	16
2100	RB-9A-1-4	X	X	O	L		1
2101	RB-9A-1-4	X	X	T	X	1D	1
2102	RB-9A-1-4	A	X	C	X	1D	6
2103	RB-9A-1-4	W	X	C	X		5
2104	RB-9A-1-4	W	N	C	X		1
2105	RB-9A-1-4	W	R	C	X	1D	5
2106	RB-9A-1-4	M	B	C	X		1
2107	RB-7A-1-3	G	X	C	X		3
2108	RB-7A-1-3	W	X	C	X		2
2109	RB-7A-1-3	W	R	C	F	1D	1
2110	RB-7A-1-3	M	A	C	X		1
2111	RB-7A-1-3	W	N	O/T	X		3
2112	RB-7A-1-3	W	H2	C	X		1
2113	RB-7A-1-3	X	X	O	X		11
2114	RB-7A-1-4	W	N	O	X		2
2115	RB-7A-1-4	M	R	C	F	2D	2
2116	RB-7A-1-4	M	N	O	X		4
2117	RB-7A-1-4	M	N	C	X		1
2118	RB-7A-1-4	W	N	C	G	2D	2
2119	RB-7A-1-4	W	X	X	X		11
2120	RB-7A-1-4	X	X	X	X		29
2121	RB-7A-1-4	X	X	O	L		6
2122	RB-7A-1-4	W	A	C	X		10
2123	RB-7A-1-4	W	A	C	F	1D	1
2124	RB-7A-1-4	W	R	C	X		3
2125	RB-7A-1-4	M	A	C	X	4D	4
2126	RB-7A-1-4	W	R	O	X		3
2127	RB-9A-1-1	W	C	C	X		2

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2128	RB-9A-1-1	W	X	X	X		7
2129	RB-9A-1-2	W	X	X	X		4
2130	RB-9A-1-2	W	C	C	X		1
2131	RB-9A-1-2	X	X	O	X	2D	2
2132	RB-9A-1-2	X	X	X	X		16
2133	RB-7B-1-1	X	X	X	X		11
2134	RB-7B-1-1	X	X	X	S		3
2135	RB-7A-1-7	W	R	X	X		2
2136	RB-7A-1-7	K	H1	X	X		1
2137	RB-7A-1-7	X	X	X	X		2
2138	RB-7A-1-7	W	X	C	X		2
2139	RB-9A-1-6	X	X	O	X	4D	86
2140	RB-9A-1-6	X	X	S	X		2
2141	RB-9A-1-6	W	N	C	X		12
2142	RB-9A-1-6	K	N	C	X		2
2143	RB-9A-1-6	W	X	C	X	1D	18
2144	RB-9A-1-6	W	R	C	X		20
2145	RB-9A-1-6	W	B	C	X	1D	6
2146	RB-9A-1-6	W	H6	T	G	1D	1
2147	RB-9A-1-6	M	H2	C	X	1D	1
2148	RB-9A-1-6	M	H1	C	X		3
2149	RB-9A-1-6	M	H3	C	X		1
2150	RB-12C-1-1	X	X	X	X		150
2151	RB-12C-1-1	W	R	C	X		70
2152	RB-12C-1-2	X	X	X	X		21
2153	RB-12C-1-2	X	X	O	L		1
2154	RB-12C-1-2	W	X	C	X		11
2155	RB-12C-1-2	A	X	C	X		5
2156	RB-12C-1-2	W	N	C	X		3
2157	RB-12C-1-2	W	R	C	X	1D	7
2158	RB-12C-1-2	W	R	C	F		2
2159	RB-12C-1-2	M	H2	C	X		2
2160	RB-12C-1-3	X	X	X	X		2
2161	RB-12C-1-3	W	X	C	X		3
2162	RB-12C-1-3	W	N	C	X		2
2163	RB-12C-1-3	W	R	C	X	1D	3
2164	RB-12C-1-3	W	A	C	F	1D	1
2165	RB-12C-1-3	K	H3	C	X		1
2166	RB-12C-1-3	M	H2	C	X		1
2167	RB-12C-1-5	X	X	X	X		3
2168	RB-12C-1-5	W	N	C	X		1
2169	RB-12C-1-5	W	R	C	X		1
2170	RB-12C-1-5	M	H2	C	X	1D	1
2171	RB-9A-1-7	W	X	X	X		8
2172	RB-9A-1-7	W	N	C	X		1
2173	RB-9A-1-7	OT					1
2174	RB-9A-1-8	M	B	C	X	2D	2
2175	RB-13A-1-1	W	X	X	X		5

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2176	RB-13A-1-1	X	X	X	X		8
2177	RB-13A-1-2	W	X	X	X		9
2178	RB-13A-1-2	X	X	X	X		6
2179	RB-13A-1-2	W	A	O	R		1
2180	RB-12A-1-1	W	X	X	X		33
2181	RB-12A-1-1	W	R	C	X	2D	2
2182	RB-10A-1-4	X	X	X	X		3
2183	RB-10A-1-3	K	N	C	X	1D	1
2184	RB-10A-1-3	W	R	C	G	1D	1
2185	RB-10A-1-3	W	R	C	F	3D	3
2186	RB-10A-1-3	W	B	C	X	2D	2
2187	RB-10A-1-3	W	N	C	X	2D	2
2188	RB-10A-1-3	W	H4	C	X		3
2189	RB-10A-1-3	W	R	O	X		3
2190	RB-10A-1-3	W	R	C	X		10
2191	RB-10A-1-3	W	C	C	X		7
2192	RB-10A-1-3	W	N	O	X		2
2193	RB-10A-1-3	W	X	X	X		6
2194	RB-10A-1-3	X	X	O	L		6
2195	RB-10A-1-3	X	X	X	X		38
2196	RB-10A-1-3	W	H1	C	X		4
2197	RB-10A-1-1	W	X	X	X		14
2198	RB-10A-1-1	W	R	C	X		1
2199	RB-10A-1-2	W	X	X	X	6D	56
2200	RB-10A-1-2	W	H5	C	P	1D	1
2201	RB-10A-1-2	W	R	O	X	2D	2
2202	RB-10A-1-2	W	R	C	X	2D	29
2203	RB-10A-1-2	W	H1	C	X		3
2204	RB-10A-1-2	W	N	C	X		8
2205	RB-10A-1-2	K	R	C	I		4
2206	RB-10A-1-2	X	X	X	X		1
2207	RB-10A-1-2	M	B	C	X		5
2208	RB-10A-1-2	X	X	O	L		9
2209	RB-7A-1-3	M	C	C	X		4
2210	RB-7A-1-3	X	X	O	L		1
2211	RB-7A-1-3	X	C	C	X		2
2212	RB-10A-1-2	X	X	O	X	5D	5
2213	RB-10A-1-2	W	B	O	X		2
2214	RB-12C-1-4	W	X	X	X		3
2215	RB-12C-1-4	W	C	C	X		2
2216	RB-12C-1-4	X	X	X	X		3
2217	RB-12B-1-1	W	R	C	G	2D	9
2218	RB-12B-1-1	W	R	C	X	2D	2
2219	RB-12B-1-1	W	A	C	X		5
2220	RB-12B-1-1	M	A	C	X		2
2221	RB-12B-1-1	M	R	C	X		3
2222	RB-12B-1-1	W	N	C	X		2
2223	RB-12B-1-1	M	C	C	X		2

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2224	RB-12B-1-1	W	A	C	R	1D	1
2225	RB-12B-1-1	W	H1	C	X		2
2226	RB-12B-1-1	X	X	O	L		9
2227	RB-12B-1-1	X	X	X	X		90
2228	RB-8A-1-2	W	A	C	X	1D	1
2229	RB-8A-1-2	X	X	O	X	3D	3
2230	RB-8A-1-2	M	H2	C	X	1D	1
2231	RB-8A-1-2	W	R	C	X		8
2232	RB-8A-1-2	W	R	C	L	2D	2
2233	RB-8A-1-2	W	R	C	X	1D	1
2234	RB-8A-1-2	W	X	X	X		11
2235	RB-8A-1-2	W	N	C	X		3
2236	RB-8A-1-2	X	X	O	L		1
2237	RB-8A-1-2	OT					1
2238	RB-8A-1-2	X	X	O			43
2239	RB-8A-1-1	W	R	C	X		2
2240	RB-8A-1-1	X	X	C	X	1D	1
2241	RB-8A-1-1	X	X	C	X	2D	2
2242	RB-8A-1-1	X	X	O	X		13
2243	RB-8A-1-1	W	N	C	X	1D	1
2244	RB-8A-1-1	W	X	X	X		2
2245	RB-6E-1-5	W	B	C	X		1
2246	RB-6E-1-5	W	X	X	X		2
2247	RB-12C-1-1	W	B	C	X	1D	14
2248	RB-12C-1-1	K	HI	C	X		1
2249	RB-12C-1-1	W	H4	C	X		1
2250	RB-12C-1-1	W	R	C	G	2D	2
2251	RB-12C-1-1	W	R	C	X	BORDES 7D	7
2252	RB-12C-1-1	X	X	C	L		19
2253	RB-12C-1-1	M	H1	C	X	5D	10
2254	RB-12C-1-1	X	X	O	X	6D	6
2255	RB-12C-1-1	W	N	C	X		18
2256	RB-12C-1-1	W	X	C	X		50
2257	RB-12B-1-2	X	X	O	X		266
2258	RB-12B-1-2	X	X	O	L		21
2259	RB-12B-1-2	W	A	C	X		8
2260	RB-12B-1-2	M	C	C	X	4D	4
2261	RB-12B-1-2	W	C	C	X	3D	9
2262	RB-12B-1-2	K	N	C	X		6
2263	RB-12B-1-2	M	R	C	X	2D	12
2264	RB-12B-1-2	W	R	C	X		98
2265	RB-12B-1-2	A	X	C-O	X	1D	24
2266	RB-12B-1-1	W	X	X	X	4D	72
2267	RB-12B-1-1	X	X	O	X	4D	4
2268	RB-8A-1-3	G	R	C	X	4D	8
2269	RB-8A-1-3	G	R	D	X		3
2270	RB-8A-1-3	W	R	C	X	3D	14
2271	RB-8A-1-3	G	X	X	X	1D	7

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2272	RB-8A-1-3	G	N	C	X	4D	12
2273	RB-8A-1-3	W	N	C	X	1D	4
2274	RB-8A-1-3	W	X	X	X	1D	38
2275	RB-8A-1-3	X	X	O	L		5
2276	RB-8A-1-3	X	X	O	E		11
2277	RB-8A-1-3	X	X	X	X		63
2278	RB-8A-1-3	X	X	O	X	3D	3
2279	RB-8A-1-6	W	R	C	F	1D	1
2280	RB-8A-1-6	W	R	C	X		2
2281	RB-8A-1-6	X	X	X	X		1
2282	RB-8A-1-6	W	N	C	X		1
2283	RB-8A-1-6	G	R	C	X		2
2284	RB-6B-2-2	W	X	X	X		9
2285	RB-6B-2-2	A	X	X	X		8
2286	RB-6B-2-2	W	H3	C	X		1
2287	RB-6B-2-2	X	X	O	E		13
2288	RB-6B-2-2	X	X	O	X	1D	1
2289	RB-6B-2-2	X	X	X	X		22
2290	RB-6D-1-1	A	X	C	X		1
2291	RB-6D-1-1	X	X	X	X		3
2292	RB-6B-1-1	W	R	C	X	1D	11
2293	RB-6B-1-1	W	N	C	X		3
2294	RB-6B-1-1	A	X	X	X		3
2295	RB-6B-1-1	X	X	O	L		26
2296	RB-6B-1-1	W	X	X	X		18
2297	RB-6B-1-1	G	X	X	X	9D	29
2298	RB-6B-1-1	X	X	O	E		17
2299	RB-6B-1-1	X	X	X	X		58
2300	RB-6B-1-1	X	X	O	X	2D	2
2301	RB-6E-1-1	X	X	O	X	3D	3
2302	RB-6E-1-1	X	X	X	X		7
2303	RB-6E-1-1	W	N	C	X		1
2304	RB-6E-1-5	W	R	C			3
2305	RB-6E-1-5	W	N	C		1D	1
2306	RB-6E-1-5	M	C	C			1
2307	RB-6E-1-5	X	X	O			11
2308	RB-6E-1-1	W	X	X	X		13
2309	RB-6E-1-1	G	X	X	X		3
2310	RB-6E-1-1	X	X	O	L		1
2311	RB-6E-1-2	W	X	X	X	2D	37
2312	RB-6E-1-2	W	R	C	X	1D	13
2313	RB-6E-1-2	K	N	C	X		14
2314	RB-6E-1-2	M	N	O	X		1
2315	RB-6E-1-2	X	X	X	X		85
2316	RB-6E-1-2	X	X	O	X	3D	3
2317	RB-6E-1-2	G	X	X	X	2D	2
2318	RB-6E-1-2	X	X	O	E	2D	17
2319	RB-6E-1-2	X	X	O	L		2

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2320	RB-6E-1-2	A	X	X	X		14
2321	RB-6E-1-4	W	X	X	X	1D	21
2322	RB-6E-1-4	W	R	C	X	3D	43
2323	RB-12B-1-2	W	B	C	X		16
2324	RB-12B-1-2	W	R	C	F	3D	3
2325	RB-12B-1-2	W	H1	C	X		7
2326	RB-12B-1-2	W	X	C	X	5D	40
2327	RB-12B-1-2	W	N	C	X		50
2328	RB-12B-1-2	G	B	C	X	1D	3
2329	RB-12B-1-2	K	H3	C	X		2
2330	RB-12B-1-2	W	R	O	X	3D	3
2331	RB-6B-2-1	A	X	O-C	X	CLASICO	32
2332	RB-6B-2-1	X	X	O-CZ	X	4D	93
2333	RB-6B-2-1	X	X	O	S	1D	28
2334	RB-6B-2-1	X	X	O	L	2D	5
2335	RB-6B-2-1	W	X	C	X	1D	27
2336	RB-6B-2-1	G	R	C	X	3D	9
2337	RB-6B-2-1	G	X	C	X		5
2338	RB-6B-2-1	W	R	C	F	1D	11
2339	RB-6B-2-1	A	X	O	P	1D	1
2340	RB-6B-2-1	W	C	C	X		2
2341	RB-6B-2-1	M	R	C	X		1
2342	RB-8A-1-4	X	X	X	X		20
2344	RB-8A-1-4	M	C	C	X		1
2345	RB-8A-1-4	A	X	C	X		13
2346	RB-8A-1-4	W	R	C	F	1D	1
2347	RB-8A-1-4	G	A	C	X		4
2348	RB-8A-1-4	W	R	C	X	1D	7
2349	RB-8A-1-4	W	N	C	X	1D	4
2350	RB-8A-1-4	M	R	C	X		2
2351	RB-8A-1-4	M	B	C	X		2
2352	RB-8A-1-4	W	N	C	I	1D	1
2353	RB-8A-1-4	W	B	C	I	1D	1
2354	RB-8A-1-4	K	C	C	X	1D	1
2355	RB-6A-3-2	W	A	C	X		1
2356	RB-6A-3-2	W	R	C	X		14
2357	RB-6A-3-2	W	X	X	X		8
2358	RB-6A-3-2	M	R	O	X		2
2359	RB-6A-3-2	M	R	C	X	2D	2
2361	RB-6B-2-1	W	R	O	X		5
2362	RB-6B-2-1	W	R	C	X		5
2363	RB-6B-2-1	W	N	C	X		6
2364	RB-6E-1-3	X	X	O	X	5D	92
2365	RB-6E-1-3	A	X	C	X	3D	3
2366	RB-6E-1-3	A	X	C	X	1D	1
2367	RB-6E-1-3	W	H4	O	X	1D	1
2368	RB-6E-1-3	W	X	C	X	3D	25
2369	RB-6E-1-3	A	X	C-O	X	2D	34

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2370	RB-6E-1-3	X	X	O	L		1
2371	RB-6E-1-3	W	R	C	X	2D	19
2372	RB-6E-1-3	X	X	O	S		10
2373	RB-6E-1-3	G	R	C	X	1D	8
2374	RB-6E-1-3	G	X	C	X		7
2375	RB-6E-1-3	G	R	O	X		1
2376	RB-6E-1-3	W	C	C	X	1D	1
2377	RB-6E-1-3	W	A	C	X	1D	10
2378	RB-6E-1-3	W	N	C	X	2D	6
2379	RB-6E-1-3	W	A	C	F	1D	1
2380	RB-6E-1-4	W	C	C	X	1D	10
2381	RB-6E-1-4	W	N	C	X	2D	10
2382	RB-6E-1-4	W	N	O	X		1
2383	RB-6E-1-4	W	R	C	G	3D	3
2384	RB-6E-1-4	K	N	C	X		3
2385	RB-6E-1-4	X	X	X	X		135
2386	RB-6E-1-4	X	X	O	L		13
2387	RB-6E-1-4	X	X	O	E		5
2388	RB-6E-1-4	X	X	O	X	4D	4
2389	RB-6A-3-1	X	X	O	E		5
2390	RB-6A-3-1	A	X	X	X		2
2391	RB-6A-3-1	X	X	O	L		1
2392	RB-6A-3-1	W	R	C	X		5
2393	RB-6A-3-1	W	X	X	X		10
2394	RB-6A-3-1	W	N	C	X		5
2395	RB-6A-3-1	X	X	X	X		73
2396	RB-6A-3-1	X	X	O	X	3D	3
2397	RB-6A-3-1	G	X	X	X		4
2398	RB-6A-3-2	W	H1	C	X		5
2399	RB-6E-1-3	M	C	C	X		2
2400	RB-6E-1-3	M	R	C	X		2
2401	RB-6E-1-3	W	B	C	X	1D	3
2402	RB-6E-1-3	W	H2	C	X		1
2403	RB-6E-1-3	W	H4	C	X		1
2404	RB-6E-1-3	G	N	C	X		1
2405	RB-6E-1-3	G	B	O	X	1D	1
2406	RB-6A-3-3	X	X	O	X		74
2407	RB-6A-3-3	A	X	O/C	X		3
2408	RB-6A-3-3	A	R	O	X	2D	2
2409	RB-6A-3-3	W	X	C	X		8
2410	RB-6A-3-3	X	X	O	L		2
2411	RB-6A-3-3	G	R	O	X		3
2412	RB-6A-3-3	G	B	O	X		1
2413	RB-6A-3-3	W	C	O	X		1
2414	RB-6A-3-3	W	B	O	X		2
2415	RB-6A-3-3	M	R	O	X		4
2416	RB-6A-3-3	M	R	C	X		8
2417	RB-6A-3-3	M	R	C	I		1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2418	RB-6A-3-2	W	B	C	X		1
2419	RB-6A-3-2	M	N	C	X	2D	3
2420	RB-6A-3-2	W	N	C	X		14
2421	RB-6A-3-2	A	X	X	X		1
2422	RB-6A-3-2	X	X	O	I		4
2423	RB-6A-3-2	X	X	X	X		90
2424	RB-6A-3-2	X	X	O	E		2
2425	RB-6A-3-2	X	X	O	X	3D	3
2426	RB-6E-1-3	OT					1
2427	RB-6A-3-4	W	X	X	X	3D	5
2428	RB-6A-3-4	W	R	C	X	1D	5
2429	RB-6A-3-4	K	N	C	X	1D	1
2430	RB-6A-3-4	M	R	C	X		1
2431	RB-6A-3-4	W	N	C	X		4
2432	RB-6A-3-4	X	X	X	X		29
2433	RB-6A-3-6	W	X	C	X	1D	1
2434	RB-6A-3-6	M	R	C	X	2D	2
2435	RB-6A-3-6	X	X	X	X		6
2436	RB-6A-3-7	W	X	X	X		1
2437	RB-6A-3-3	W	R	C	X		13
2438	RB-6A-3-3	M	A	C	X	1D	2
2439	RB-6A-3-3	M	B	C	X		8
2440	RB-6A-3-3	W	N	C	X	1D	6
2441	RB-6A-3-3	W	N	C	X		1
2442	RB-6A-3-3	W	H1	C	X		2
2443	RB-6A-3-3	W	A	T/O	X		3
2444	RB-6A-3-3	W	A	C	X	1D	11
2445	RB-6A-3-3	W	H2	C	X	3D	3
2446	RB-6A-3-3	W	R	C	X		10
2447	RB-6A-3-3	A	N	C	X	1D	1
2448	RB-6A-4-1	X	X	O	X		13
2449	RB-6A-4-1	W	C	C	X		1
2450	RB-6A-4-1	W	C	O	X		1
2451	RB-6A-4-1	W	A	C	X		1
2452	RB-6A-4-1	W	N	C/T	X		3
2453	RB-6A-4-1	W	B	C	X		4
2454	RB-6A-4-1	M	A	C	X		3
2455	RB-6A-4-1	M	B	C	X		1
2456	RB-6A-3-7	W	N	O	X		4
2457	RB-6A-3-7	W	R	C	X		6
2458	RB-6A-3-7	M	H6	C	X		1
2459	RB-6A-3-7	K	C	C	X		2
2460	RB-6A-3-7	W	C	C	X	2D	5
2461	RB-6A-3-7	X	X	O	L		1
2462	RB-6A-3-7	X	X	X	X		21
2463	RB-6A-4-5	W	X	X	X		5
2464	RB-6A-4-5	W	A	C	P	1D	1
2465	RB-6A-4-5	W	N	C	X		3

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2466	RB-6A-4-5	X	X	X	X		16
2467	RB-6A-4-5	X	X	O	L		1
2468	RB-6A-4-7	W	A	O	X		1
2469	RB-6A-4-7	X	X	X	X		1
2470	RB-6A-4-6	W	X	X	X		16
2471	RB-6A-4-6	X	X	X	X		33
2472	RB-6A-4-6	W	R	C	R	1D	1
2473	RB-6A-4-6	W	N	C	X		3
2474	RB-6A-4-6	W	A	C	X	1D	4
2475	RB-6A-4-4	X	X	O	X	1D	21
2476	RB-6A-4-4	W	B	O	X		1
2477	RB-6A-4-4	W	N	C	X		2
2478	RB-6A-4-4	W	N	O	X		6
2479	RB-6A-4-4	K	N	C	X		1
2480	RB-6A-4-4	W	A	O	X		2
2481	RB-6A-4-4	M	N	C	X	1D	1
2482	RB-6A-4-4	W	C	C	P	1D	1
2483	RB-6A-4-4	W	X	C	X		1
2484	RB-6A-4-4	W	H1	C	X		1
2485	RB-6C-1-3	X	X	O/Z	X		325
2486	RB-6C-1-3	X	X	O	S		104
2487	RB-6C-1-3	X	X	O	L		43
2488	RB-6C-1-3	X	X	O	X	2D	23
2489	RB-6C-1-3	X	X	Z	X	15D	15
2490	RB-6C-1-3	A	X	C	X	2D	22
2491	RB-6C-1-3	A	X	O	P	1D	1
2492	RB-6C-1-3	W	X	C	X	5D	195
2493	RB-6C-1-3	P	X	C	X	1D	2
2494	RB-6A-4-6	K	H3	C	X		1
2495	RB-6A-4-6	X	X	O	L		2
2496	RB-6A-1-1	X	X	Z	L	1D	1
2497	RB-6A-1-1	W	N	C	X		1
2498	RB-6A-1-1	X	X	O	W		8
2499	RB-6A-1-1	A	X	X	X		3
2500	RB-6A-1-1	W	X	X	X		16
2501	RB-6A-1-1	W	R	C	X		8
2502	RB-6A-1-1	X	X	O	X	2D	2
2503	RB-6A-1-1	X	X	X	X		15
2504	RB-6A-5-1	W	R	C	X		4
2505	RB-6A-5-1	W	C	C	X		3
2506	RB-6A-5-1	X	X	X	X		1
2507	RB-6A-5-1	A	X	X	X		1
2508	RB-6A-5-1	W	N	O	X		1
2509	RB-6A-5-1	X	X	O	E		2
2510	RB-6A-5-1	W	X	X	X		3
2511	RB-6A-5-2	U	X	O	X		2
2512	RB-6A-5-2	X	X	O	L		2
2513	RB-6A-4-2	X	X	X	X		78

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2514	RB-6A-4-2	X	X	O	X	2D	2
2515	RB-6A-4-2	X	X	C	X	3D	3
2516	RB-6A-4-2	X	X	O	X		6
2517	RB-6A-4-2	A	X	C	X	1D	23
2518	RB-6A-4-2	W	H3	C	X	12D	12
2519	RB-6A-4-2	W	X	C	X		8
2520	RB-6A-4-2	W	N	C	X	2D	15
2521	RB-6A-4-2	W	N	C	I		2
2522	RB-6A-4-2	W	H2	C	X		3
2523	RB-6A-4-2	M	B	C	X		2
2524	RB-6A-4-2	W	H1	C	X	3D	3
2525	RB-6A-4-2	W	R	C	X	1D	26
2526	RB-6A-4-2	W	R	O	X	1D	1
2527	RB-6A-4-2	W	A	C	X	2D	8
2528	RB-6A-4-2	W	A	C	O	1D	1
2529	RB-6A-4-2	W	B	C	X		2
2530	RB-6A-4-2	M	R	C	F	2D ACANALADO	2
2531	RB-6A-4-2	W	C	C	X	1D	3
2532	RB-6A-4-3	X	X	X	X		60
2533	RB-6A-4-3	X	X	C	L		3
2534	RB-6A-4-3	W	H3	C	X		2
2535	RB-6A-4-3	W	B	C	G	1D	1
2536	RB-6A-4-3	W	C	C	X	2D	12
2537	RB-6A-4-3	W	R	C	X		18
2538	RB-6A-4-3	W	R	C	G	1D	1
2539	RB-6A-4-3	W	R	C	R		1
2540	RB-6A-4-3	W	H1	C	X		3
2541	RB-6A-4-3	W	H7	C	X	1D	1
2542	RB-6A-4-3	M	B	C	X		3
2543	RB-6A-4-3	W	N	C	X		5
2544	RB-6A-4-3	W	B	C	X		2
2545	RB-6A-4-3	A	N	C	X		4
2546	RB-6A-4-3	K	R	C	X		1
2547	RB-6A-4-3	M	H1	C	X		10
2548	RB-6A-4-3	A	X	C	X		25
2549	RB-6A-4-3	X	X	C	X		30
2550	RB-6A-4-3	M	R	C	X	1D	1
2551	RB-6A-5-2	W	X	X	X		7
2552	RB-6A-5-2	X	X	X	X		30
2553	RB-6A-5-2	M	C	O	X		3
2554	RB-6A-5-2	G	X	X	X	1D	1
2555	RB-6A-5-2	W	R	C	X		8
2556	RB-6A-5-2	W	N	C	X	1D	1
2557	RB-6A-5-2	W	H6	C	X		4
2558	RB-6A-5-2	M	H5	C	X		3
2559	RB-6A-5-2	W	B	C	I	1D	1
2560	RB-6A-6-11	M	R	C	X	1D	1
2561	RB-6A-6-11	W	C	C	X		1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2562	RB-6A-6-11	X	X	X	X		5
2563	RB-6A-6-16	M	N	O	X		1
2564	RB-6A-6-15	W	A	C	X	1D	1
2565	RB-6A-6-15	W	N	C	X		2
2566	RB-6A-6-15	M	A	O	X		1
2567	RB-6A-6-15	W	R	O	X		1
2568	RB-6A-6-15	X	X	X	X		7
2569	RB-6A-6-12	X	X	X	X		3
2570	RB-6A-4-2	M	C	C	I	1D	1
2571	RB-6A-4-2	M	R	C	X		3
2572	RB-6A-5-3	X	X	X	X		30
2573	RB-6A-5-3	A	X	C	X		9
2574	RB-6A-5-3	W	X	C	X	1D	13
2575	RB-6A-5-3	W	N	C	X		3
2576	RB-6A-5-3	M	H3	C	X		1
2577	RB-6A-5-3	W	C	C	X	1D	1
2578	RB-6A-5-3	M	B	C	X		1
2579	RB-6A-5-3	W	B	C	X		2
2580	RB-6A-5-3	W	R	C	X		3
2581	RB-6A-5-3	W	R	C	I	1D	1
2582	RB-6A-5-3	G	B	C	X	1D	1
2583	RB-6A-6-3	X	X	X	X		42
2584	RB-6A-6-3	X	X	O	L		6
2585	RB-6A-6-3	A	X	C	X	1D	9
2586	RB-6A-6-3	W	X	C	X		16
2587	RB-6A-6-3	W	N	C	X		3
2588	RB-6A-6-3	W	R	C	X		4
2600	RB-6A-6-12	X	X	O	L		2
2601	RB-6A-6-14	W	B	C	L	1D	1
2602	RB-6A-6-14	X	X	X	X		2
2603	RB-6A-6-14	M	C	X	X		1
2604	RB-6A-6-9	M	A	C	X	1D	2
2605	RB-6A-6-9	W	A	O	X		2
2606	RB-6A-6-9	M	H2	C	X	1D	1
2607	RB-6A-6-9	M	N	C	X	3D	3
2608	RB-6A-6-9	M	N	O	X		2
2609	RB-6A-6-9	M	R	O	X	1D	7
2610	RB-6A-6-9	W	C	C	X		2
2611	RB-6A-6-9	W	R	C	X		6
2612	RB-6A-6-9	W	R	C	H	1D	1
2613	RB-6A-6-9	X	X	O	L		3
2614	RB-6A-6-9	W	N	O	X		4
2615	RB-6A-6-9	W	N	C	X		6
2616	RB-6A-6-9	W	X	X	X	1D	23
2617	RB-6A-6-9	X	X	O	X	3D	3
2618	RB-6A-6-9	X	X	X	X		54
2619	RB-6A-6-9	W	A	C	X		1
2620	RB-6A-6-6	A	X	C	X		4

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2621	RB-6A-6-6	W	X	C	X		3
2622	RB-6A-6-6	W	N	C	X		1
2623	RB-6A-6-6	W	R	C	X		2
2624	RB-6A-6-6	K	N	C	X		3
2625	RB-6A-6-4	X	X	X	X		50
2626	RB-6A-6-4	M	B	C	X		7
2627	RB-6A-6-4	W	N	C	X		35
2628	RB-6A-6-4	W	R	C	X		7
2629	RB-6A-6-4	W	X	X	X		8
2630	RB-6A-6-4	A	X	X	X		6
2631	RB-6A-6-7	M	R	C	G	1D	1
2632	RB-6A-6-7	M	R	C	X		19
2633	RB-6A-6-7	W	R	C	X		8
2634	RB-6A-6-7	W	B	C	X	1D	1
2635	RB-6A-6-7	X	X	X	X		1
2636	RB-6A-6-7	K	H3	C	X		2
2637	RB-6A-6-7	W	N	C	F	1D	1
2638	RB-6A-6-5	W	H8	C	I	1D	1
2639	RB-6A-6-5	M	C	C	X	1D	1
2640	RB-6A-6-3	W	B	C	X		3
2641	RB-6A-6-3	M	H1	C	X		5
2642	RB-6A-6-3	W	H2	C	X		2
2643	RB-6A-6-3	M	H2	C	X		3
2644	RB-6A-6-3	K	R	C	X		1
2645	RB-6A-6-3	K	A	C	X		1
2646	RB-6A-6-2	X	X	X	X		29
2647	RB-6A-6-2	X	X	C	X	1D	1
2648	RB-6A-6-2	X	X	O	L		2
2649	RB-6A-6-2	A	X	C	X		4
2650	RB-6A-6-2	X	X	O	S		1
2651	RB-6A-6-2	W	X	C	X		6
2652	RB-6A-6-2	W	H9	C	X		1
2653	RB-6A-6-2	M	H2	C	X		3
2654	RB-6A-6-2	M	H1	C	X		1
2655	RB-6A-6-2	W	R	C	X		6
2656	RB-6A-5-4	X	X	X	X		35
2657	RB-6A-5-4	X	X	C	X	1D	1
2658	RB-6A-5-4	X	X	O	L		2
2659	RB-6A-5-4	W	R	C	X		8
2660	RB-6A-6-5	W	R	C	X	1D	1
2661	RB-6A-6-5	W	X	X	X		5
2662	RB-6A-6-5	X	X	X	X		2
2663	RB-6A-6-1	W	H8	C	X		1
2664	RB-6A-6-1	A	X	C	P		1
2665	RB-6A-6-1	W	N	C	X		5
2666	RB-6A-6-1	M	R	C	X		1
2667	RB-6A-6-1	W	R	C	X		4
2668	RB-6A-6-1	W	B	C	X		3

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2669	RB-6A-6-1	X	X	C	X		10
2670	RB-6C-2-1	X	X	Z	X	2D	2
2671	RB-6C-2-1	X	X	O	X	1D	1
2672	RB-6C-2-1	W	X	C	X		5
2673	RB-6C-2-1	W	X	C	X		2
2674	RB-6C-2-1	W	R	C	X		7
2675	RB-6C-2-1	W	R	C	X	1D	3
2676	RB-6C-2-1	X	X	X	X		17
2677	RB-6C-2-1	X	X	O	S		14
2678	RB-6C-1-2	G	X	C	X		11
2679	RB-6C-1-2	OT					2
2680	RB-6A-6-9	W	H6	C	P	1D	1
2681	RB-6A-6-8	X	X	O	X	4D	4
2682	RB-6A-6-8	X	X	X	X		106
2683	RB-6A-6-8	X	X	O	L		7
2684	RB-6A-6-8	M	R	C	X	2D	2
2685	RB-6A-6-8	W	C	C	P	2D	2
2686	RB-6A-6-8	W	H1	C	X		5
2687	RB-6A-6-8	M	A	C	X	1D	2
2688	RB-6A-6-8	M	H4	C	X		1
2689	RB-6A-6-8	W	R	C	X	3D	12
2690	RB-6A-6-8	W	A	C	X	2D	14
2691	RB-6A-6-8	W	N	C	X	3D	11
2692	RB-6A-6-8	K	N	C	X		2
2693	RB-6A-6-8	W	C	O	X	1D	6
2694	RB-6A-6-8	M	N	C	X		2
2695	RB-6A-6-8	W	X	C	X		24
2696	RB-6C-1-7	W	B	O	X		5
2697	RB-6C-1-7	W	A	C	X		1
2698	RB-6C-1-7	M	R	C	F	1D	1
2699	RB-6C-1-7	W	R	C	X	1D	15
2700	RB-6A-5-4	M	H1	C	X		2
2701	RB-6A-5-4	A	X	C	X		4
2702	RB-6A-5-4	M	H5	C	X	1D	1
2703	RB-6A-5-4	M	H2	C	X		3
2704	RB-6A-5-4	K	H3	C	X		4
2705	RB-6A-5-4	W	X	C	X		10
2706	RB-6A-5-5	X	X	X	X		7
2707	RB-6A-5-5	X	X	O	L		1
2708	RB-6A-5-5	X	X	O	X	1D	1
2709	RB-6A-5-5	M	H3	C	X		2
2710	RB-6A-5-5	W	C	C	X		2
2711	RB-6A-5-5	A	X	C	X		4
2712	RB-6C-1-1	X	X	X	X	CLASICO	232
2713	RB-6C-1-1	X	X	Z	X	1D	2
2714	RB-6C-1-1	X	X	C	X	5D	5
2715	RB-6C-1-1	X	X	O	X	2D	2
2716	RB-6C-1-1	X	X	P	X	1D	1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2717	RB-6C-1-1	X	X	O	S		12
2718	RB-6C-1-1	X	X	O	L		1
2719	RB-6C-1-1	W	X	C	X		38
2720	RB-6C-1-7	W	C	C	X		1
2721	RB-6C-1-7	M	R	C	X		7
2722	RB-6C-1-7	W	H3	C	X	3D	4
2723	RB-6C-1-7	X	X	X	X		33
2724	RB-6C-1-7	W	N	C	X	5D	21
2725	RB-6C-1-7	W	X	X	X		26
2726	RB-6C-1-7	W	N	C	D		1
2727	RB-6C-1-12	M	H1	C	X	1D	1
2728	RB-6C-1-12	W	A	C	X	1D	3
2729	RB-6C-1-12	W	R	C	X		4
2730	RB-6C-1-12	W	R	O	X		5
2731	RB-6C-1-12	X	X	O	X	1D	1
2732	RB-6C-1-12	X	X	X	X		11
2733	RB-6C-1-11	W	N	C	X		1
2734	RB-6C-1-11	W	H6	C	X		2
2735	RB-6C-1-11	M	H1	C	X	1D	8
2736	RB-6C-1-11	W	C	C	X	5D	7
2737	RB-6C-1-11	X	X	O	X	2D	2
2738	RB-6C-1-11	M	H5	C	X	1D	6
2739	RB-6C-1-11	X	X	X	X		40
2740	RB-6C-1-1	X	X	C	P		1
2741	RB-6C-1-1	W	C	C	X		3
2742	RB-6C-1-1	W	H1	C	X		1
2743	RB-6C-1-1	W	B	C	X		2
2744	RB-6C-1-1	W	R	C	X		4
2745	RB-6C-1-1	W	N	C	X		4
2746	RB-6C-1-1	P				1D	1
2747	RB-6C-1-4	X	X	D/Z	X		139
2748	RB-6C-1-4	X	X	C	X	5D	5
2749	RB-6C-1-4	X	X	O	X	3D	3
2750	RB-6C-1-4	X	X	Z	X	1D	1
2751	RB-6C-1-4	X	X	O	S		38
2752	RB-6C-1-4	X	X	O	L		4
2753	RB-6C-1-4	W	X	C	X	1D	122
2754	RB-6C-1-4	W	X	C	S	2D	2
2755	RB-6C-1-4	W	X	C	I	1D	1
2756	RB-6C-1-4	W	B	C	X		1
2757	RB-6C-1-4	G	A	C	X		1
2758	RB-6C-1-4	W	N	C	X		9
2759	RB-6C-1-4	W	N	C	O		1
2760	RB-6C-1-2	W	R	C	X		24
2761	RB-6C-1-2	W	N	C	I	1D	1
2762	RB-6C-1-2	W	B	C	X		1
2763	RB-6C-1-2	W	N	C	X		7
2764	RB-6C-1-2	G	A	C	X		5

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2765	RB-6C-1-2	W	A	C	X		2
2766	RB-6C-1-2	A	X	O	X		4
2767	RB-6C-1-2	X	X	C	P		1
2768	RB-6C-1-2	X	X	C	S		45
2769	RB-6C-1-2	X	X	Z	X	22D	22
2770	RB-6C-1-2	X	X	O	X	18D	18
2771	RB-6C-1-2	X	X	O/Z	X	4D	644
2772	RB-6C-1-8	W	B	C	X	1D	5
2773	RB-6C-1-8	W	N	C	X		21
2774	RB-6C-1-8	W	C	C	X	2D	14
2775	RB-6C-1-8	M	N	C	X	1D	5
2776	RB-6C-1-8	M	R	O	X		2
2777	RB-6C-1-8	W	H4	C	X	1D	1
2778	RB-6C-1-8	W	H6	C	X	1D	1
2779	RB-6C-1-8	W	H3	C	X	1D	1
2780	RB-6C-1-11	W	R	C	X	1D	8
2781	RB-6C-1-11	M	C	O	P	1D	1
2782	RB-6C-1-11	M	R	C	X	3D	5
2783	RB-6C-1-11	W	A	O	X		9
2784	RB-6C-1-11	M	A	C	R	1D	1
2785	RB-6C-1-11	W	H1	C	D	1D	1
2786	RB-6C-1-10	M	B	C	X	2D	4
2787	RB-6C-1-10	M	R	C	X		6
2788	RB-6C-1-10	W	R	C	F	1D	1
2789	RB-6C-1-10	M	H1	C	X		3
2790	RB-6C-1-10	W	A	C	X		8
2791	RB-6C-1-10	W	C	C	X	1D	7
2792	RB-6C-1-10	W	A	O	X		5
2793	RB-6C-1-10	W	R	O	X		9
2794	RB-6C-1-10	M	C	C	X		3
2795	RB-6C-1-10	W	N	C	F	1D	1
2796	RB-6C-1-10	W	N	C	X		5
2797	RB-6C-1-10	K	N	C	X		1
2798	RB-6C-1-10	X	X	O	X	4D	4
2799	RB-6C-1-10	X	X	X	X		44
2800	RB-6C-1-4	W	R	C	Z	1D	16
2801	RB-6C-1-4	X	X	O/Z	D	1D	1
2802	RB-6C-1-4	M	C	C	X		1
2803	RB-6C-1-4	M	B	C	X		1
2804	RB-6C-1-4	M	R	C	X		1
2805	RB-6C-1-4	P	A	C	X		3
2806	RB-6C-1-10	X	X	D	L		2
2807	RB-6C-1-9	W	C	C	B	1D	1
2808	RB-6C-1-9	W	C	C	X		2
2809	RB-6C-1-9	W	R	G	X		1
2810	RB-6C-1-9	W	A	O	X		1
2811	RB-6C-1-9	W	A	C	X		2
2812	RB-6C-1-9	M	H5	C	X		1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2813	RB-6C-1-9	W	N	C	X		1
2814	RB-6C-1-9	X	X	X	X		18
2815	RB-6C-1-9	X	X	O	L		1
2816	RB-6C-1-8	W	R	C	G	8D	8
2817	RB-6C-1-8	W	R	O	X		9
2818	RB-6C-1-8	W	B	O	X		3
2819	RB-6C-1-8	M	C	C	X		1
2820	RB-6C-1-6	M	B	C	X		6
2821	RB-6C-1-6	W	H5	C	X	1D	1
2822	RB-6C-1-6	W	N	C	X		10
2823	RB-6C-1-6	W	B	C	X		4
2824	RB-6C-1-6	W	R	C	X		19
2825	RB-6C-1-6	W	R	C	X	1D	1
2826	RB-6C-1-6	X	X	O	L		20
2827	RB-6C-1-6	W	H1	C	X		3
2828	RB-6C-1-6	W	H2	C	X		1
2829	RB-6C-1-6	W	X	C	X		17
2830	RB-6C-1-6	W	H1	C	G	1D	1
2831	RB-6C-1-6	W	H1	C	X	2D	2
2832	RB-6C-1-6	W	A	C	X		9
2833	RB-6C-1-6	X	X	O	X	3D	3
2834	RB-6C-1-6	M	R	C	X	1D	1
2835	RB-6C-1-6	M	R	C	X		2
2836	RB-6C-1-6	W	B	C	X	1D	1
2837	RB-6C-1-6	M	N	C	X	1D	1
2838	RB-6C-1-6	M	N	C	X		1
2839	RB-6C-1-6	X	X	O	X		156
2840	RB-6C-1-6	W	N	C	X	1D	1
2841	RB-6C-1-6	W	H6	C	X		1
2842	RB-6C-1-6	W	H1	C	X	1D	1
2843	RB-6C-1-6	X	H3	C	X	1D	1
2844	RB-6C-1-6	X	H3	C	X		1
2845	RB-6C-1-6	W	N	C	X	1D	1
2846	RB-6C-1-6	M	H1	C	X		1
2847	RB-6C-1-6	X	X	O	I		1
2848	RB-6C-1-3	W	N	C	X		27
2849	RB-6C-1-3	W	C	C	X		2
2850	RB-6C-1-5	X	X	O/Z	X		480
2851	RB-6C-1-5	X	X	O	X	7D	7
2852	RB-6C-1-5	X	X	C	I	1D PELLIZCADO	1
2853	RB-6C-1-5	M	A	C	X		4
2854	RB-6C-1-5	G	R	C	X		7
2855	RB-6C-1-5	G	N	C	X		2
2856	RB-6C-1-5	G	B	C	X		3
2857	RB-6C-1-5	G	X	C	X	2D	8
2858	RB-6C-1-5	X	X	O	S		6
2859	RB-6C-1-5	X	X	O	K		58
2860	RB-6C-1-8	M	H5	C	X	1D	5

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2861	RB-6C-1-8	W	H8	C	X		7
2862	RB-6C-1-8	W	R	C	X		14
2863	RB-6C-1-8	X	X	X	X		105
2864	RB-6C-1-8	W	X	X	X		16
2865	RB-6C-1-8	X	X	O	L		9
2866	RB-6C-1-8	X	X	O	X	6D	6
2867	RB-6C-1-8	M	N	C	D	1D	1
2868	RB-6C-1-3	W	R	C	X		60
2869	RB-6C-1-3	W	A	C	X		15
2870	RB-6C-1-3	W	B	C	X		8
2871	RB-6C-1-3	W	H1	C	X		3
2872	RB-6C-1-3	K	H3	C	X		1
2873	RB-6C-1-3	X	X	C	I	1D	1
2874	RB-6C-1-3	W	R	C	D	1D	1
2875	RB-6C-1-3	P	H1	C	X	1D	1
2876	RB-6C-1-3	W	H6	C	X		1
2877	RB-6C-1-3	G	R	C	X		4
2878	RB-6C-1-3	G	X	C	X		53
2879	RB-6C-1-3	M	R	C	X	1D	8
2880	RB-11A-1-4	X	X	O	X	2D	2
2881	RB-11A-1-4	X	X	X	X		45
2882	RB-11A-1-4	X	X	O	L		6
2883	RB-11A-1-4	A	X	X	L		3
2884	RB-11A-1-4	W	A	O	X		6
2885	RB-11A-1-4	W	A	C	X	1D	1
2886	RB-11A-1-4	W	R	C	X		2
2887	RB-11A-1-4	W	R	C	D	1D	11
2888	RB-11A-1-4	M	R	O	X		2
2889	RB-11A-1-4	W	N	X	X	1D	5
2890	RB-11A-1-4	W	H2	C	X		3
2891	RB-11A-1-4	W	C	C	X		3
2892	RB-11A-1-4	W	X	X	X		11
2893	RB-11A-1-3	W	R	C	G	2D	2
2894	RB-11A-1-3	W	C	C	X		6
2895	RB-11A-1-3	M	R	H1	X		1
2896	RB-11A-1-3	W	A	C	X		3
2897	RB-11A-1-3	W	H3	C	X		2
2898	RB-11A-1-3	W	H1	C	X		2
2899	RB-11A-1-3	M	H3	C	X		1
2900	RB-11A-1-3	W	A	O	X		4
2901	RB-11A-1-3	X	X	O	L		20
2902	RB-11A-1-3	M	H6	C	X		2
2903	RB-11A-1-3	W	R	C	X	3D	24
2904	RB-11A-1-3	W	X	X	X		1
2905	RB-11A-1-3	M	N	C	X	1D	2
2906	RB-11A-1-3	W	N	C	X		9
2907	RB-11A-1-3	W	X	C	D	1D	1
2908	RB-11A-1-3	W	N	T	G	1D	1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2909	RB-11A-1-3	X	X	O	X	2D	2
2910	RB-11A-1-3	X	X	X	X		67
2911	RB-11A-1-2	W	A	C	F	1D	1
2912	RB-11A-1-2	W	H3	C	X		1
2913	RB-11A-1-2	W	A	C	X	3D	8
2914	RB-11A-1-2	M	R	C	X	3D	8
2915	RB-11A-1-2	W	R	C	X		15
2916	RB-11A-1-2	W	X	X	X	4D	31
2917	RB-11A-1-2	W	H1	C	X		1
2918	RB-11A-1-2	W	N	O	X		5
2919	RB-11A-1-2	W	N	C	X		1
2920	RB-6C-1-5	P	X	C	X	3D	3
2921	RB-6C-1-5	W	N	C	X	2D	40
2922	RB-6C-1-5	W	N	C	F	2D	2
2923	RB-6C-1-5	W	R	C	R	1D	1
2924	RB-6C-1-5	W	A	C	R	1D	1
2925	RB-6C-1-5	W	R	O	X	2D	2
2926	RB-6C-1-5	W	R	C	X	25D	95
2927	RB-6C-1-5	W	N	O	X		3
2928	RB-6C-1-5	M	B	C	X	2D	10
2929	RB-6C-1-5	M	R	C	X		34
2930	RB-6C-1-5	W	H4	C	X		1
2931	RB-6C-1-5	W	B	C	X		4
2932	RB-6C-1-5	K	C	C	X		1
2933	RB-6C-1-5	W	B	O	X		8
2934	RB-6C-1-5	W	H1	C	X		2
2935	RB-6C-1-5	M	R	T	X		2
2936	RB-6C-1-5	W	X	C	X		28
2937	RB-6C-1-5	M	B	C	F	2D	2
2938	RB-6C-1-5	W	H6	C	X		1
2939	RB-6C-1-5	M	R	C	I		1
2940	RB-11A-1-2	A	X	X	X		7
2941	RB-11A-1-2	G	R	C	X		3
2942	RB-11A-1-2	G	X	X	X	1D	9
2943	RB-11A-1-2	X	X	X	X		90
2944	RB-11A-1-2	X	X	O	L		12
2945	RB-11A-1-2	X	X	O	E		13
2946	RB-11A-1-2	X	X	O	X	1D	1
2947	RB-11A-1-1	G	R	C	X	2D	4
2948	RB-11A-1-1	G	X	X	X	3D	9
2949	RB-11A-1-1	W	R	C	X		4
2950	RB-11A-1-1	A	X	X	X		7
2951	RB-11A-1-1	W	X	X	X		15
2952	RB-11A-1-1	X	X	X	X		90
2953	RB-11A-1-1	X	X	O	E		11
2954	RB-11B-1-5	W	C	C	X		1
2955	RB-11B-1-5	X	X	X	X		2
2956	RB-11B-1-5	X	X	O	L		1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
2957	RB-11-1-4	W	A	C	X	2D	2
2958	RB-11-1-4	X	X	X	X		1
2959	RB-11B-1-6	X	X	X	X		3
2960	RB-11B-1-6	W	R	C	X	1D	1
2961	RB-11B-1-6	M	C	C	X	1D	1
2962	RB-11B-1-8	W	A	C	F	1D	1
2963	RB-11B-1-8	W	A	O	X		1
2964	RB-11B-1-8	W	C	C	X	1D	1
2965	RB-11B-1-8	W	X	X	X		11
2966	RB-11B-1-8	X	X	X	X		7
2967	RB-11B-1-7	W	R	C	X	1D	1
2968	RB-11B-1-7	W	N	C	X	1D	1
2969	RB-11B-1-7	X	X	O	X	1D	1
2970	RB-11B-1-7	M	N	C	X		1
2971	RB-11B-1-7	W	X	X	X		1
2972	RB-11B-1-3	G	X	X	X	2D	6
2973	RB-11B-1-3	X	X	X	X		6
2974	RB-11B-1-3	A	X	X	X		7
2975	RB-11B-1-3	X	X	O	E		5
2976	RB-11B-1-3	W	R	C	X	1D	3
2977	RB-11B-1-3	W	X	X	X		8
2978	RB-11B-1-2	G	X	X	X	3D	5
2979	RB-11B-1-2	W	X	X	X		6
2980	RB-11B-1-2	W	R	C	X		2
2981	RB-11B-1-2	A	X	X	X		7
2982	RB-11B-1-2	X	X	Z	X		85
2983	RB-11B-1-2	A	X	X	X		4
2984	RB-11B-1-2	X	X	O	E		21
2985	RB-11B-1-2	X	X	O	X	4D	4
2986	RB-11B-1-1	X	X	O	X	4D	4
2987	RB-11B-1-1	X	X	Z	X		80
2988	RB-11B-1-1	A	X	X	X	1D	5
2989	RB-11B-1-1	G	X	X	X		1
2990	RB-11B-1-1	A	X	X	X		7
2991	RB-11B-1-1	X	X	O	E		13
2992	RB-11B-1-1	W	X	X	X		1
2993	RB-11B-1-12	X	X	X	X		126
2994	RB-11B-1-12	X	X	O	X	5D	5
2995	RB-11B-1-12	W	X	X	X	10D	72
2996	RB-11B-1-12	X	X	O	L		1
2997	RB-11B-1-12	W	C	C	X		2
2998	RB-11B-1-12	W	A	C	X	1D	2
2999	RB-11B-1-12	W	N	C	X	1D	9
3000	RB-6C-1-5	W	C	C	X		3
3001	RB-6C-1-5	W	B	C	I	1D	1
3002	RB-6C-1-5	W	A	C	F	1D	1
3003	RB-6C-1-5	M	C	C	X		5
3004	RB-6C-1-5	W	A	C	X	2D	8

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
3005	RB-11B-1-11	X	X	O/Z	X		94
3006	RB-11B-1-11	A	X	C	X	1D	5
3007	RB-11B-1-11	A	X	C	I		1
3008	RB-11B-1-11	W	X	C	X	4D	86
3009	RB-11B-1-11	W	R	C	X		15
3010	RB-11B-1-11	W	R	C	F		1
3011	RB-11B-1-11	W	N	C	X		3
3012	RB-11B-1-11	W	B	C	X		2
3013	RB-11B-1-11	W	H1	C	X		1
3014	RB-11B-1-11	M	B	C	X		2
3015	RB-11B-1-11	M	R	C	X		1
3016	RB-11B-1-11	M	C	C	X	1D	1
3017	RB-6B-2-2	G	N	C	X	1D	1
3018	RB-7B-1-6	W	N	C	I	1D	1
3019	RB-6C-1-4	M	R	C	X	1D	1
3020	RB-11B-1-12	W	R	C	X		1
3021	RB-11B-1-12	W	B	O	X		1
3022	RB-11B-1-12	M	R	C	X	2D	7
3023	RB-11B-1-12	W	X	C	D	1D S	1
3025	RB-6A-4-5	M	H6	C	H	1D S	1
3026	RB-6A-4-6	W	N	C	X	1D S	1
3027	RB-7A-1-5	X	X	O	X	1D	1
3028	RB-6C-1-11	W	R	C	X	1D	1
3029	RB-6B-1-1	W	X	X	D	1D	1
3030	RB-6A-4-4	W	C	C	X	1D	1
3031	RB-6A-4-4	X	X	O	X	1D	1
3032	RB-6A-4-5	X	X	T	X	1D	1
3033	RB-6A-5-2	W	X	O	X	1D	1
3034	RB-6A-5-2	X	B	T	X	1D	1
3035	RB-6A-3-4	M	R	C	X	1D	1
3036	RB-6A-4-6	W	C	C	X	1D	1
3037	RB-6A-4-6	X	X	O	L	1D	1
3038	RB-6C-1-4	W	N	C	B	1D	1
3039	RB-6A-4-6	M	H9	C	B	1D	1
3040	RB-11B-1-10	X	X	X	X		70
3041	RB-11B-1-10	A	X	C	X		8
3042	RB-11B-1-10	W	B	C	X		1
3043	RB-11B-1-10	W	H1	C	X		1
3044	RB-11B-1-10	W	C	C	X		4
3045	RB-11B-1-10	W	B	C	X	1D	1
3046	RB-11B-1-10	W	N	C	X		5
3047	RB-11B-1-10	M	R	C	F	1D	1
3048	RB-11B-1-10	W	R	C	X	2D	14
3049	RB-11B-1-10	W	A	C	X	2D	5
3050	RB-11B-1-10	M	R	C	X		1
3051	RB-11B-1-10	M	R	C	I	1D	1
3052	RB-11B-1-10	W	X	C	X		21
3053	RB-11B-1-10	W	N	C	D	1D	1

Table B.1 (Continued)

Code	Provenance	Tech	Color	Form	Decoration	Observations	Count
3054	RB-11B-1-10	K	N	C	X		1
3055	RB-11B-1-10	K	H1	C	X		2
3056	RB-11B-1-10	W	C	C	X		1
3057	RB-11B-1-10	W	H1	C	X	1D	3
3058	RB-11B-1-10	W	A	C	X		2
3059	RB-11B-1-10	W	B	C	X		5
3060	RB-7B-1-4	M	A	C	X	1D S	1
3061	RB-6A-3-4	M	H3	C	X	1D S	1
3062	RB-7B-1-3	M	H1	C	X	1D S	1
3063	RB-6A-6-4	W	H2	C	X	1D	1
3064	RB-6A-5-1	B	C	C	X	1D S	1
3065	RB-6A-4-3	W	R	C	X	10D	10
3066	RB-6A-4-2	M	R	C	D	1D S	1
3067	RB-6A-5-1	M	N	C	D	1D S	1
3068	RB-6A-4-3	K	H5	C	X	1D S	1
3069	RB-6A-6-8	W	N	C	X	1D S	1
3070	RB-6A-4-3	A	X	C	X		2
3071	RB-6A-4-3	M	R	C	X		2
3072	RB-6A-4-3	W	R	C	X		2
3073	RB-11B.1-1	OT					1
3074	RB-1H-12-2	M	N	C	D	1D	1
3075	RB-1F-1-2	A	X	O	X	1D	1
3076	RB-9B-2-2	M	R	O	D	1D	1
3077	RB-11A-5-3	X	X	O	L	1D	1
3078	RB-11A-5-4	M	A	C	G	1D	1
3080	RB-11B-1-9	M	R	C	I	1D	1
3081	RB-11B-1-9	M	R	C	X	1D	1
3082	RB-11B-1-9	W	N	C	X	3D	16
3083	RB-11B-1-9	W	H6	C	X	1D	1
3084	RB-11B-1-9	M	R	C	X	3D	23
3085	RB-11B-1-9	W	R	C	X	1D	15
3086	RB-11B-1-9	W	R	T	X	1D	1
3087	RB-11B-1-9	X	X	C	X		450
3088	RB-11B-1-9	X	X	C	L	1D	12
3089	RB-11B-1-9	W	X	C	X		100
3090	RB-11B-1-9	A	X	C	X		50
3091	RB-11B-1-9	A	X	C	X	19D	19
3092	RB-11B-1-9	W	X	C	G	10D	10
3093	RB-7B-1-5	M	R	C		10 S	1
3094	RB-6C-1-4	M	H1	C	I	10 S	1
3095	RB-6A-4-5	M	H6	C	I	10 S	1
3096	RB-6A-4-3	W	R	C	R	1D S	1
3097	RB-6A-4-3	W	H6	C	X	1D S GUINDA	1
3098	RB-6A-4-3	W	H4	C	R	1D	1
3099	RB-6A-4-3	M	R	C	I	1D	1

Intact rims were subjected to typological analysis, including classification by rim form, lip form, and quantitative measures of rim diameter and, when available, height.

Table B.2 Ceramic Typological Analysis
All rim diameters and vessel heights are reported in centimeters.
Vessel Forms: A (Direct), B (Exterior Enlarged), C (Interior Enlarged), D (Exterior Doubled Over), E (Interior Doubled Over), F (Everted horizontal), G (Everted angle), H (Everted smoothly curved), I (Everted full-arc).
Lip Forms: A (Rounded), B (Pointed) C (Flat), D (Exterior Bevel), E (Interior Bevel), F (Grooved), G/H/I (Castled), J (Inverted Lip)
Base Form: As noted

Table B.2

Codigo	**Rim Form**	**Lip Form**	**Altura**	**Diametro**	**Observaciones**
422C	A	C		X	
422D	A	A		X	
378A	I	A		42	
415A	H	D	FB	X	
415B	A	C		X	
415C	F	A		42	
415D	NUBBIN FEET				ROJO GUINDA
3074A	A	C	FB	18	DF
3075A	D	A	CUELLO	16	DF
3077A	G	A	CUELLO	36	DF
3078A	G	A	FB	32	DF
344A	H	B		20	DF
344B	H	X		24	D
260A	A	C		19	D
290A	H	C		22	D
405	H	E		28	D
401	A	A		20	D
406A	A	A		26	
496B	A	A		25	D
404A	K	B		30	D
395A	I	A		24	D
395B	H	B		28	D
376	G	A		18	D
384A	H	A		32	D
384B	G	A		X	D

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
508	A	B		X	D
379	H	A		40	D
414A	H	C		X	D
414B	H	X		X	D
199C	B	A		20	
199E	B	B		X	
199F	B	B		X	
199G	G	A		24	
199H	G	A		20	
199I	G	A		X	
199J	G	A		X	
199K	G	A		X	
199L	G	C		24	
408A	B	A		30	
412A	C	C		26	RESIST D, F
412B	H	C		X	D,F
417A	H	C		X	D,F
415A	H	C		22	D,F
415B	H	C		24	D,F
407A	A	C		24	
407B	A	E		32	
407C	A	C		30	
422A	C	A		24	
422B	D	A		22	GROOVED
853	H	C		26	D
850	H	A		25	
847A	H	C		50	D
763A	I	A		23	D OLLA
763B	I	D		23	D
763C	H	B		28	D
763D	H	D		20	D
834					MINICUENCO D
832	G	A		22	
833	B	C		X	
830A	D	C		X	D
830B	A	E		X	D
843A	H	D		18	D
843B	I	D		22	D
843C	D	C		22	D
843D	H	A		X	D
882A	B	C		X	D

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
882B	H	A		X	D
882C	A	B		X	D
335	D	C		38	
679	A	A		X	
678A	H	B		X	
675A	A	C		20	
675B	A	C		X	
606	D	C		19	
603	A	C		X	
602					SOPORTE D
714	A	A		X	
721	H	A		X	
711	H	B		X	
719	H	F		24	
707	H	A		X	
865	A	F		18	RANURADO
1187					
809	H	A		20	
822	A	A		18	
823	G	A		34	D
848A	A	A		X	
848B	A	A		X	
848C	A	X		X	
73	F	C		X	D
872	A	C		X	
879	H	A		X	
892	A	A		X	
530	H	A		20	D
525	H	A		X	
527					REBORDE BASAL D
551A	A	A		30	
551B	A	A		X	
552A	A	T		X	
749	H			22	
760	H	T		24	
759	K	B		X	D
757	A	A		25	
747	D	C		16	
746A	D	A		40	D
746B	H	C		28	D
786	H	X			

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
780A	D	C		44	D
780B	H	C		44	D
1164A	H	E	4.3	24	D
1164B	H	A		26	
1164C	H	B		22	
1096					CUERPO, FETO
1103	H	B		36	
1044	A	A		X	D
1101	A	D		30	D
1048	C	B			F, ASA
1092A	H	F		32	
1092B	H	A		X	
1045A	H	C		36	D,F
1045B	H	B		40	D
1045C	B	C		X	D,F
1045D	H	A		22	D
1045E	H	A		9	D,F
1108A	C	B		X	
1108B	H	A		32	
1108C	A	A		26	
1095	H	A		20	
1099A	A	A		20	
1099B	B	A		X	
1098A	H	A		27	D
1098B	A	X		X	D
1046A	H	A		36	D
1100A	H	A		22	D
1100B	H	A		19	
1093A	I	D		25	D
1093B	G	A		30	
1032A	H	A		40	D
1031A	A	D		14	D
1024	A	E		20	D
1037	A	A		36	
1022					IMPRESO F
1039					CUERPO F
1024A	A	B		16	
1025	B	B		40	
1036A	J	A		22	D
1036B	H	D		13	D
1026A	I	D		20	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
1026B	H	A		10	
2515B	A	C		X	
2518					CUERPOS
2234	I	A	3.9	23	
3022A	H	A		12	JAR
3022B	BASE	FLAT			D,F
2986A	A	A		26	
2986B	A	A		X	
2791A	A	C		36	D,F
2788A	A	C		26	
2786A	A	A		24	D,F
2698A	G	A		38	D,F
2726A	A	A		24	D,F
2722A	A	A		20	D,F
2798A	A	A		28	D,F
2798B	I	A		20	D,F
2724A	A	A		X	D,F
2782A	A	C		50	D,F
2782B	A	A		14	
2782C	A	B		26	
2738A	A	J		26	D,F
3097A	H	A		26	D,F
2999A	A	C		X	D,F
2994B	A	B		28	D,F
2994C	G	A		18	D,F
2942A	SOPORTE	BOTUN			
2914A	B	A	FB	X	D,F
2914B	A	B		X	D,F
2914C	B	C		22	
2946A	H	A		18	D,F
2911A	B	A		16	D,F
2913A	J	A		X	D,F
2913B	C	A	FB	22	D,F
2916A	H	A		12	
2916B	A	B		X	
2916C	H	A		X	D,F
2893A	G	A		48	
2995A	H	A			
2995B	G	A			
2995C	G	C			
3084A	C	C		18	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
3084B	C	C		X	
3084C	A	A		18	
3082A	A	B		16	
3082B	A	A		X	
3082C	G	A		26	
3092A	G	A		30	
3092B	G	A		X	
3092C	D	A		X	
3092D	A	B		X	
3092E	H	A		X	
3092F	G	A		18	
3092G	A	B			
3092A	A	E			
2908A	A	A		12	D,F
2909A	A	A		26	SUPER IMRE D,F
2909B	C	A		X	
2905A	D	B		22	D,F
2903A	H	B		20	D,F
2994A	F	A		26	
2631	C	A	4.5	24	
2637	C	A		24	
2634	A	A			
2428A	A	A			
2438B	A	A			
2427A	C	A			
2427B	A	B			
2427C	G	A			
2429	C	A			
3006	A	A		X	
3008A	H	A		20	
3008B	A	B		X	
3008C	A	A		X	
3008D	D	A		X	
3008E	H	A		26	
3085A	I	A		44	D,F
3083A	H	A		24	D,F
3053A	A	B		18	D,F
3086A	A	A		8	D,F
3081	SOPORTE				
2868A	A	A		40	
2868B	G	A		X	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
2868C	B	A		20	
2489A	D	C		28	
2489B	D	C		28	
2489C	A	A		26	
2489D	D	C		24	
2489E	D	C		42	
2489F	A	C		26	
2489G	D	C		X	
2489H	D	C		X	
2489I	D	C		X	
2489J	D	A		X	
2489K	D	A		X	
2489L	D	A		X	
2489M	D	A		X	
2488A	D	A		24	
2488B	A	B		28	
2488C	G	A		26	
2488D	A	A		22	
2833C	I	A		24	D,F
2800A	A	B		32	D,F
2749A	D	A		26	
2749B	D	A		X	
2749C	G	A		10	
2748A	A	J		X	
2748B	D	A		40	
2448C	B	A		20	
2493A	D	C		30	D,F
2879A	A	A		20	
2874A	A	A		34	D,F
2490A	C	C		16	D,F
2490B	A	C		24	
2868A	BASE	FLAT		X	D,F
2064A	H	C		X	D,F
2878A	A	J		X	
2878B	A	C		24	
2492A	A	E		X	
2492B	A	B		20	
2492C	A	C		X	
2715B	D	A		X	
2713A					FONDO
2713B	D	C		X	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
2713C	D	C		X	
2714A					CUERPO
2714B	A	X		X	
2714C	A	B		26	
2714D	B	R		X	
2714E	A	C			
2807					FONDO
2761					CUERPO
2770A	H	B		38	D
2770B	D	A		40	D
2770C	H	A		30	
2770D	H	B		X	
2770E	H	A		24	
2770F	H	C		20	
2770G	D	A		X	
2770H	B	B		X	
2770H	B	E		X	
2925A	H	A		34	
2925B					CUERPO
2927A					CUERPO
2927B					CUERPO
2851A	I	F		24	D
2851B	I	A		22	
2851C	C	E		36	
2851D	H	X		X	
2851E	H	X		X	
2851F	A	E		X	
2851G	A	J		28	
2926A	A	J		X	
2926B	B	A		32	
2926C	B	A		29	
2926D	A	A		30	
2926E	B	A		X	
2926F					FONDO,F
2746					FONDO POLICROMO, D
2716	H	A		X	
2715A	D	F		X	
2735A	G	A		X	
2780A	D	A		14	
2780B	A	B		12	
2736A	A	A		20	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
2736B	A	A		42	
2736C	A	A		X	
2737A	H	B		24	
2737B	A	A		28	
2836A	BASE	FLAT			
2825A	BASE	FLAT			
2821A	A	A		22	
2843A	A	A		26	
2840A	A	B		20	
2837A	A	A		X	
2831A	A	A		26	
2830A	A	B		20	
2834A	B	A		26	
2750A	D	C		38	
2833A	I	C		26	D,F
2833B	G	B		26	D,F
2689B	H	E		22	
2689C	C	A		20	
2526	B	A		35	D,F
2517	C	X		X	
2528				X	CUERPO
2531	A	A		X	
2570	A	A		X	
2525	A	E		21	
2530A				X	CUERPO
2530B				X	CUERPO
2520A	C	E		X	
2520B	H	A		X	
2514A	I	D		22	D,F
2514B	H	D		24	D,F
2527A	H	A		20	
2527B	C			X	
2524A	A	A		X	
2524B	H	A		X	
2525C	H	A		X	
2515	H	A		26	
2332D	D	A		26	
2297A	D	A		26	
2297B	A	A		18	
2297C	C	C		20	
2297D	A	A		36	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
2300A	A	B		17	
2292A	D	A		32	
2321A	B	A		18	
2388A	A	A		28	
2388B	F	A		20	
2388C	A	A		X	
2388C	H	A		X	
2388D	G	X		X	
2388E	A	A		X	
2322A	A	A		X	
2322B	A	A		X	
2322C	A	A		18	
2380A	H	B		20	
2381A	H	A	R.B 2.6	22	
2147A	G	A		41	D,F
2143A	H	A		X	
2146A	A	B		14	D,F, S
2145A	G	A		28	
2139A	I	A		16	
2139B	H	A		X	
2139C	H	A		48	
2101A	D	A		16	D,F X BASE ANULAR
2102A	D	C		30	
2099A	A	A		X	
2281A	A	A		26	
2338A	A	A		X	
2335A	A	B		24	
2336A	SOPORTE	BOTON			
2336B	PESTAÑA	BASAL			
2336C	G	A		X	
2332A	A	A		X	
2332B	B	C		26	
2332C	F	C		32	
2186B	A	A		14	
2186A	B	C		28	
2185A	C	A		40	D,F
2185B	A	A	2.4	14	D,F
2185C	A	A		40	
2330A	FLAT BASE				
2324A	A	A		24	
2324B	A	A			

Table B.2 (Continued)

Codigo	**Rim Form**	**Lip Form**	**Altura**	**Diametro**	**Observaciones**
2326A	G	A		30	
2326B	G	A		28	
2326C	A	A		X	
2326D	H	A		12	
2257A	H	B		28	
2269A	A	C		28	
2263A	H	A	4.2	X	D,F
2263B	G	B		X	
2264A	F	B		28	
2264B	A	A		26	
2264C	G	A		24	
2093A	I	A		26	
2093B	I	A		26	
2081A	A	D		X	
2092A	FLAT BASE			X	
2085A	A	A		24	
2069A	G	A		26	
2074A	A	A		46	
2068A	H	A		X	
2057A	G	A		42	
2064A	A	A		X	
2067A	B	A		X	
2067B	FLAT BASE				
2061A	B	C		X	
2059A	D	C		28	
2094A	G	A		18	
2115A	A	A		22	
2118A	A	A		X	
2125A	G				
2125B	A	A		50	
2125C	A	A		23	
3093A	B	A		28	
2021A	A	A		30	
2020A	A	A		X	
2019A	A	A		16	
2023A	G	A		24	
2023B	H	A		X	
2025A	H	C		30	
2025B	A	A		X	
2033A	G	A		19	
2031A	G	A		30	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
2080A	H	A		9	
2080B	J	A			
2080C	X	D			
2054A	A	E		50	
2131A	B	A		X	
2096A	B	A		X	
2096B	A	A		X	
2174	H	A		38	
2266C	B	E		12	
2266D	B	A		10	
2267A	D	A		33	
2267B	A	A		35	
2267C	A	B		20	
2267D	B	C		28	
2218A	H	A		21	
2218B	H	A		44	
2218C	H	A		34	
2247	A	E		26	
2253A	H	B		31	
2253B	H	A		28	
2253C	A	A		21	
2253D					
2253E					
2251A	H	E		22	
2251B	H	A		24	
2251C	C	E		22	
2251D	H	A		22	
2254A	H	E		30	
2405					CUERPO
2366					CUERPO
2364A	H	C		41	
2364B	D	J		20	D
2364C	H	A		22	
2364D	H	B		22	
2364E	X	B			NO IDENTIFICADO
2369A	X	C		18	
2369B	H	A		28	
2373	A	A		24	
2365					CUERPO
2401					FONDO
2378A	H	A		18	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
2378B	H	A		17	
2379	H	A			
2368A	D	J			
2368B	A	A			
2368C	A	A		17	
2538	A	A		48	D,F
2535	A	A		X	
2536A	A	A		40	
2536B	C	E		20	
2541					CUERPO
2852	B	E		38	D
2581					CUERPO DECORADO
2577	A	A			
2574	H	A		26	
2585					CUERPO
2560					FONDO
2460	B	A		12	
2396A	D	B		34	
2396B	D	A		28	
2396C	X	X		X	DETERIORADO
2702	H	A		33	D
2657	H	A		20	
2638					CUERPO
2639					CUERPO
2660	C	A		28	
2438					NO IDENTIFICADO D,F
2444	A	C		28	
2383A	A	A		48	
2383B	G	A		X	
2383C	A	D		X	
2349A	A	A		X	D,F
2354A	A	C		20	
2348A	A	F		X	
2353A	A	A		X	
2352A	A	A		X	
2312A	G	A		X	
2316A	B	C		50	
2316B	D	A		X	
2316C	F	B		26	
2604A	B	A		32	
2606A	BASE	FLAT			

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
2680A	A	A		X	
2617A				42	
2617B	H	C		16	
2617C	A	C			
2419A	H	A		X	
2359A	G	A		X	
2417	C	A		X	
2440	A	A		X	
2445	A	A		X	
2408				X	CUERPOS
2681A				X	FONDO
2681B	I	D	5.5	30	D,F
2681C					CUERPO
2681D					CUERPO
2687	H	A		33	D.F
2693	I	X		X	MUY DETERIORADO
2684A	B	X		28	
2684B				X	CUERPO
2685A	A	A		30	
2685B	A	C		29	
2690A	A	X			FONDO
2690B	H	A		X	
2691A	C	E		X	
2691B	C	E		22	
2691C	C	A		X	
2689A	D	E		27	
2271	A	A		32	
2270A	B	A		26	B
2270B	C	B		25	
2270C	X				CUERPO
2278A	G	X		23	
2278B	B	A		22	
2278C	H	E		18	
2279	A	A		X	D
2305	C	E		14	
2240	X				CUERPO
2243	X				CUERPO
2241A	A	A		18	
2241B	A	A		21	
2288	D	A		28	D
2301A	A	A		24	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
2301B	B	B		23	
2371	X				FONDO
2377	D	A		22	
2367	H	A		16	
2376	H	E		21	
2359B	H	A		20	
2425A	A	A		X	
2425B	D	A		X	
2425C	B	A		X	
2433A	A	E		X	
2434A	A	B		20	
2564A	A	C		28	D,F
2647A	G	C		X	
2708A	D	A		18	D,F
2564A	A	A		22	
2556D	A	D		11	PULIDO NEGRO D,F
2554A	A	A		30	
2554B	A	A		X	
2502A	D	A		X	
2502B	D	A		X	
2496	A	C		26	
2474A	B	A		14	
2880A	F	A		24	
2880B	H	B		X	
1130A	H	D		40	D
1130B	H	D		28	
1130C	A	C		26	
1085	H	D			
1073A	A	A		20	D
1073B	G	A		22	D
1083	H	D			
1136	A	C			D
1078A	H	D		24	
1078B	H	A			
1084A	K	D		36	
1084B	H	D		24	
1084C	H	A		30	FLUTING
987	A	G			DIBUJO
1019	A	D			DIBUJO
981	A	B		36	
1110	A	A			

Table B.2 (Continued)

Codigo	**Rim Form**	**Lip Form**	**Altura**	**Diametro**	**Observaciones**
1069A	A	A		23	
1069B	H	A		25	
994	A	A		26	
159	G	B		X	D
157	D	A		36	D
124	A	A		X	
125	H	A			
132	A	E		28	
126	A	A		X	
105					BASE ANULAR D
83	H	A		X	
142A	B	D		X	
142B	B	B		X	
277	A	C		X	
275	H	B		11	
160A	H	A	6.9	27	D
168	B	E		X	
167A	A	A		20	
167B	D	A		33	
167C	K	D		X	
80	A	A		X	
77	A	A		24	
79	A	A		X	
657	D	A		X	
532					PEDESTAL D
579	A	C		X	
533A	G	X		X	
533B	H	X		X	D
429	A	E		X	
436A					BASE D
436B	H	A		18	
425	I	A		X	
3	A	A		X	
7	A	A		X	GUBIADO CON REBORDE D
173	H	C		11	D ASA ACANALADA
174	D	C		X	D
172	G	C		25	D
177					VERTEDERA D
170A	A	C		X	
170B	H	A		X	
170C	D	D		X	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
95	H	X		X	
1201	A	B		20	D
365A	H	A			
969	H	A		22	CAJETE ACANALADO D
1010					CAJETE CUERPO
959	A	F		28	LABIO RANURADO
970	H	A		X	
1012	A	E		18	
965	H	A		X	
1011	H	E		X	
350	A	A		34	
329	H	A		38	
330A	A	A		25	
330B	D	A		X	
259A	A	A		24	
919	A	A		28	
909	A	A		30	
912	H	B		X	
694	A	A		34	
918	A	E		X	
659	D	C		35	D
664	A	B		X	D
858	H	D		37	D
859	H	F		35	D
802	H	D			
738	G	A		50	D
732	D	A		32	
735	A	A		X	
474	I	X		X	
488	A	A		X	
483	A	E		30	
492	A	E		X	
727	D	A		26	D
542	A	A		20	
540	H	B		10	D TECOMATE
946	D	A		42	
945A					PEDESTAL D
945B	A	B		42	
567A	H	A		40	D
566	D	A		32	D
367	A	A		32	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
876	A	A		X	
877	H	A		X	
943	A	A		30	
942	K	A		22	
885	G	X		X	
597	A	E		27	D
575A	A	A		50	
575B	D	B		X	D
599	A	C		20	
569	A	A		26	
576	A	E		X	
876	H	A		X	
771A	A	B		22	
776	K	A		50	
447	H	X		X	
448	A	A		X	
453A	H	A		18	
453B	H	A		X	
453C	H	A		30	
591					D FONDO PENDIENTE
635	H	A		X	
1017	F	E		X	DIBUJO BORDE
933	H	E		X	
932	A	F		33	
648	A	A		31	
646	B	A		X	
642	H	E		X	
639	A	A		26	
923	A	A		32	
926	H	A		X	
927					SOPORTE D
930A	H	D		X	
930B	I	A		25	
930C	A	A		18	
624	A	A		18	
633	H	E		23	
622	D	A		X	
621	H	F		X	
625	C	B		X	
626	A	A		X	
272A	H	C		32	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
317	H	A		30	
316	A	E		X	
315	D	B		34	
323	H	C		24	
318	H	B		20	
321	A	A		X	
302	H	E		28	
306	H	E		X	
303A	G	C		20	
303B	A	C		X	
301A	B	A		34	
301B	D	X		X	
301C	D	C		X	
614	H	B		22	
592	B	C		30	
951	G	A		X	
1015				X	
997A	D	A		41	
478	C	D		30	
2769A	A	A		42	
2769B	D	C		46	D
2769C	D	A		41	
2769D	D	A		40	
2769E	A	D		34	
2769F	D	A		X	
2769G	A	A		X	
2769H	D	C		30	
2769I	H	A		32	
2769J	D	A		37	D,F
999A	A	A		X	D,F
999B	H	A		28	D
1001	H	A		36	D,F
998A	A	C		24	D,F
998B	H	A		X	D,F
1157	H	A		30	D
1159	H	A		44	D,F
1156A	H	A		26	D
1156B	H	A		28	
1156C	H	A			
2866F					Cuerpo

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
3001					Cuerpo Impreso,Foto
2924					Cuerpo
2852					Cuerpo
3002	H	B			
2923					Cuerpo
3004A					Cuerpo
3004B	C	A		24	
2922A	A	X			
2922B	A	A			
2928A					Fondo
2928B	H	A		22	
2920A					Soporte con base D,F
2920B					Cuerpo
2857A					Fondo
2857B					Fondo
2921A	C	E		24	
2921B	A	X			
2937A	H	A		42	
2937B	A	A		46	
2777	B	E		20	
2774A	B	A		50	
2774B	A	B			
2867	H	A		20	
2860	C	A			D
2775	C	A		28	
2772	A	E		30	
2779					Fondo
2778	H	B			
2816A	H	A		50	
2816B	D	A		40	
2816C	G	A		26	
2816D	A	A		36	
2816E	A	C			
2816F	H	A			
2866A	G	A		30	
2866B	I	A		28	
2866C	I				
2866D	H	A		26	
2866E					Cuerpo
1086A	G	A		34	D,F

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
1129A	A	C		16	
1133A	H	C	1.6	28	D,F
1133B	A	C		30	D,F
1134A	K	A		24	D,F
1134B	C	A		20	D,F
1134C	G	A		34	D,F
1072A	A	J		12	D,F INCISO
1072B	G	C		10	D,F
1073C	A	A		24	
1073D	A	A		X	
1082A	A	A		X	D,F FLUTED
1082B	H	C	1.6	26	D,F
1131A	F/B	A		30	D,F
1131B	A	E		46	D,F
1131C	A	A		X	F GROOVED
1131D	A	C		32	F
1080A	A	A		X	
1080B	A	A		X	
1080C	A	A		X	
1151B	A	C		X	D,F
1148A	I	A	CUELLO	16	D,F
1148B	A	A		27	CAJETE D,F
1148C	H	B		30	D,F
1148D	A	E		X	
3062A	A	C	1.6	50	D,F
3060A	H	J,C	1.6	40	D,F
3026A	H	A		24	D,F
3035A	FLAT	BASE			
3038A	A	A		X	
3061A	A	A	1.6	28	D,F
3067A	A	E		18	D,F TECOMATE
3039A	A	A	1.6	18	D,F
3063A	G	A		26	D,F
3031A	A	A		26	
3025A	H	J,C		26	D,F
3033A	G	A		X	
3030A	H	A		X	
3032A	G	C		X	
3037A	A	A		34	D,F
2488E	A	J		26	
2488F	B	E			

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
2488G	B	D			
2488H	G	C			
2488I	G	A			
2488J	G	A			
2488K	G	A			
2488L	H	E			
2488M	H	E			
2488N	H	E			
2488O	D	A			
2488P	D	A			
2488Q	D	C			
2488R	A	E			
2488S	A	J			
2488T	A	J			
1149A	A	C		30	D,F
1150A	G	A		12	D,F FLUTED, MOTEADO
1152A	J	A		24	D,F
1151A	H	C			D,F
3045A	G	A		50	D,F
2967A	G	C		40	
2968A	A	C		X	
3047A	X	A		X	
3048A	D	A		24	
3049B	I	A		10	D,F
3048A	A	B		26	D,F
2957	A	A		X	
2960	H	A		X	
2976	A	A		X	
2972	H	C		12	
2984	H	A		X	
2978A	A	E		16	
2978B	H	B		18	D,F
2985A	D	C		26	
2985B	A	C		X	
2985C	D	C		X	
2985D	B	C		X	
3016A	A	A		X	
2022A	A	D		X	
2022B	H	A		X	
2207A	G	A		28	
2200A	A	D		32	D,F

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
2212A	F	A		18	
2212B	H	A		X	
2212C	G	A		28	
2212D	H	D		28	
2212E	G	A		X	
2199A	A	E		X	
2199B	H	A		12	
2199C	B	C		20	
2199D	A	A		16	
2199E	A	A		12	
2199F	A	B		X	
2183A	H	A		21	
2188A	A	A		X	
2245B	H	E		28	
2163	A	A		40	
2164	A	A		40	
2233	B	A		50	
2228					FONDO
2230					FONOD
2232	H	C		42	
2229A	I	E		24	
2229B	H	A		30	
2229C					CUERPO
2268A					B REBORDE BASAL
2268B					
2268C	C	C		24	B REBORDE BASAL
2268D					B REBORDE BASAL
2272A	B	E		21	
2272B					CUERPO
2272C	A	A		28	
2272D					FIGURILLA
2274	C	A		16	
2273	D	B		16	
3027A	OUTFLARED ERESTED	ORQUARED	5.5	28	D,F
2030A	H	A		26	
2030B	H	A		21	
2039	A	A		24	
2040					REBORDE BASAL
2041A	A	B		39	
2041B	B	A		50	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
2041C	A				
2042	H	A		41	
2002	H	A		46	
2109	H			20	
2044	H	A		18	
2050	A	A		28	
2003	H	A		35	
2013	A	A		13	
3018	G	A		32	
2217A	G	A		21	
2217B	H	A		18	
2266A	B	D		23	
2266B	A	A		24	
3161	L	A	FBI	34	Ofrena DF
3118	A	A	A	12	E
3100	C	E	X	12	DF
3117	A	C	X	30	F
3109	B	C	X	X	DF
3113	A	A	X	11	F
3122	D	A	X	X	
3171 A	D	A	X	24	D inciciones
3171 B	A	A	X	X	D
3176A	H	C	X	24	D
3176B					soporte D
3178A	H	A	X	30	D
3178B	G	A	X	27	D
3166A	H	C	X	23	D
3167A	H	A	X	38	D
3167B	D	X	X	X	D
3177A	H	A	X	44	D
3177B	H	X	X	X	D
3177C	H	F	X	36	D
3134	A	B	X	34	D
3133	G	F	X	28	D krazing negro
3159	H	A	3.2	27	D cajete gubiado
3156	H	D	X		F
3155	H	A	X	X	D
3149A	I	A	X	22	D
3149B	H	B	X	X	D
3149C	I	F	X	26	D
3149D	H	F	X	22	D

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
3149E	H	B	X	19	D
3149F	H	C	X	X	D
3149G	I	B	X	X	D
3152A	H	A	X		D
3152B	H	D	X	22	D
3350A	A	A	X	24	DF
3350B	A	A	X	30	
3350C	D	A	X	28	
3351A	C	A	X	24	DF
3351B	D	A	X	20	DF
3351C	C	A	X	24	DF
3351D	H	C	X	28	DF
3375A	D	B	X	22	DF
3375B	D	F	X	20	
3364A	A	A		22	
3364B	H	A		22	DF
3376A	A	C		22	DF
33776B	A	C		18	DF
3370 A	D	A		22	DF
3370B	B	A		28	DF
3371A	D	A		X	DF
3380A	A	C		14	DF
3380B	A	C		16	DF
3377A	A	E		14	DF
3608A	H	C		16	DF
3609A	A	C		14	DF
3648A	A	C		X	DF
3650A	H	C		22	DF
3650B	H	E		8	DF
3720A	A	A		30	D
3720B	H	D			D
3719	A	A		24	DF
3716	A	A		14	D
3712	A	C		22	D
3707					soporte D
3718	A	B			D
3710A	B	E		50	D
3706A	I	A		26	D
3706B	I	C		26	
3683	B	B			
3687	B	A		20	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
3643	A	A		16	
3640					FONDO DE OLLA
3612					FONDO DE BEAKER
3641	A	E		32	
3637A	A	A		16	
3637B	A	A		12	
3603A	A	A			
3603B	A	A		20	
3690A	A	A		12	
3610A	A	A		17	
3610B	A	F		20	
3610C	A	A		10	
3610D	D	D		12	
3696A	D	B		26	
3696B	D	A		28	
3638A	H	A		38	
3638B	I	A		36	
3638C	H	F		24	
3635A	A	A		28	
3635B	D	A		50	
3635C	D	A		50	
3636D	D	F		28	
3651A	H	A		28	
3651A	A	A		16	
2651C	A	A		32	
3663A	D	A		50	
3663B	D	A		48	
3663C	D	C		X	
3662A	D	E		28	
3662B	I	A		26	
3657A	A	J		24	
3654A	A	A		24	
3654B	F	A		30	
3654C	H	C		X	
3660A	H	A		22	DF
3667A	H	E		X	DF
3670A	A	A		14	DF
3670B	A	A		18	
3670C	A	A		22	
3679A	A	C		16	
3689A	A	E		X	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
3692A	G	B		X	DF
3692B	H	A		X	
3644A	A	C		X	DF
3013A	H	E		26	DF
3544A	B	C		X	
3544B	A	B		20	
3545A	A	A		18	
3546A	D	A		26	
3546B	D	A		X	
3547A	A	A		X	
3555A	A	C		12	DF
3556A	H	A		18	DF
3556B	D	B		40	DF
3557A	D	D		16	DF
3558A	H	A		X	
3558B	G	A		18	
3560A	G	B		26	
3560B	B	C		18	
3565A	J	A		X	
3567A	D	C		X	
3471A	G	A		24	DF CAZUELA
3467A	G	G		16	DF
3475A	A	J		18	DF
3475B	A	A		X	
422C	A	C		X	
422D	A	A		X	
378A	I	A		42	
415A	H	D		X	
415B	A	C		X	
415C	F	A		42	
415D	NUBBIN FONT				ROJO GUIND
3074A	A	C		18	DF
3075A	D	A		16	DF
3077A	G	A		36	DF
3078A	G	A		32	DF
3466A	D	B		24	
3466B	D	B		22	
3466C	D	A		24	
3466D	D	A		X	
3466E	D	A		X	
3474A	D	F		22	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
3474B	A	F		20	
3474C	A	F		20	
3200A	I	A		32	DF
3596A	A	F		18	
3595A	D	A		22	
3595B	D	A		22	
3593A	H	A		20	
3619A	M	C		22	OLLA D,F
3619B	A	F		16	
3619C	A	A		12	
3620A	I	C		X	D,F
3594A	C	C		23	D,F
3633A	D	C		26	
3633B	D	A		X	
3633C	D	B		26	
3633D	I	A		20	
3633E	H	A		28	
3632A	D	C		40	
3632B	D	C		32	
3632C	D	C		50	
3632D	D	C		32	
3632E	D	A		22	
3584A	D	A		50	
3584B	D	A		32	
3584C	D	B		28	
3584D	D	B		30	
3584E	D	B		28	
3220A	H	B		18	
3220B	D	A		32	
3220C	A	J		X	
3220D	A	J		X	
3616A	D	A		36	
3616B	A	A		X	
3616C	H	E		X	
3616D	A	E		22	
3630A	A	A		6	
3629A	A	C		X	
3626A	H	E		18	
3573A	D	C		20	
3573B	A	C		36	
3573C	A	B		X	

Table B.2 (Continued)

Codigo	Rim Form	Lip Form	Altura	Diametro	Observaciones
3590A	A	A		16	
3437A	A	E		20	D,F
3437B	A	E		20	D,F
3428A	B	A		36	D,F
3428B	D	B		26	
3428C	D	C		26	
3456A	FOOT-SOLID	NUBBIN	SOPORTE		D,F
3457A	G	B		28	D,F
3458A	D	A		X	
3458B	D	C		22	
3458C	A	B		20	
3459D	D	B		34	
3459A	D	A		X	
3459B	D	A		X	
3459C	H	C		18	
3460A	B	C		18	D,F
3482A	A	A		20	
3482B	A	A		20	
3442A	A	D		24	
3443B	H	B		24	
3445A	H	B			
3455B	B	A		10	TECOMATE
3452A	D	A		28	
3452B	A	A		16	
3452C	D	C			
3446A	A	A		18	D,F
3450A	D	A		34	D,F
3450B	D	A		24	
3450C	A	B		24	
3450D	A	B		30	
3450E	A	A		X	
3448A	H	C		18	
3448B	A	C		12	
3439A			BASE CIRCLE RING		
3434A	D	B		30	
3434B	A	C			
3427A	D	C		30	
3427B	D	C		24	
3427C	D	C			
3432A	H	A		10	
3201A	D	A		40	D,F

Table B.2 (Continued)

Codigo	**Rim Form**	**Lip Form**	**Altura**	**Diametro**	**Observaciones**
3202	H	C		30	D,F
3207A	L	A		28	D,F
3207B	A	A		X	
3215A	H	A		30	D,F
3587A	A	C		X	D,F
3481A	H	C		18	D,F
3585A	D	C		16	D,F
3585B	H	C		14	D,F
3585C	L	F		12	D,F
3585D	B	C		16	
3586A	G	A		10	
3212A	A	A		20	
3216A	A	C		X	
3213A	A	C		30	
3214A	H	A		28	
3206A	C	A		16	
3206B	A	A		18	
3203A	G	A		16	
3217A	A	C		14	
3385	FONDO RING				D,F
3407	A	E		20	D,F
3413	A	B		12	D,F
3383	D	A		16	D,F
3417	A	H		14	D,F
3384	F	B		24	D,F
3400	D	H		X	D,F
3420A	D	A		24	D,F
3420B	H	A		20	D,F
3420C	H	B		X	D,F
3420D	G	C		X	
3405A	D	C		42	D,F
3405B	D	C		28	D,F
3419A	A	C		40	D,F
3419B	A	C		28	D,F
3419C	A	A		20	
3419D	H	C		26	
3422A	D	A		26	
3422B	A	A		20	
3422C	A	A		18	

APPENDIX C - RANCHO BÚFALO OBSIDIAN ANALYSIS

Tables in this appendix are denoted by the letter “C” preceding the table number.

Obsidian Trace Element Chemical Data and Sourcing

Table C.1 Obsidian chemical sourcing data for pieces from Rancho Búfalo, Chiapas, Mexico. N = 1012
All chemical values are reported in parts per million (PPM)
Sources = EC (El Chayal), SMJ (San Martin Jilotepque), IX (Ixtepeque), ZA (Zaragoza), UK (Unknown)

Table C.1

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
1	9B-1-2	853.2	6977.2	75.8	10.6	7.4	113.4	238.6	14.7	120.3	9.9	SMJ
2	9B-1-2	426.9	6734.9	74.2	16.7	8.7	107.2	217.9	11.3	113.3	8.2	SMJ
3	9B-1-2	756.3	7429.5	71.4	15.9	4.9	125.6	227.2	11.4	119.8	11.4	SMJ
4	9B-2-1	715.6	7381.0	46.7	12.4	11.9	117.9	215.2	16.1	113.1	10.3	SMJ
5	9B-2-1	929.5	6865.6	62.1	21.2	13.8	156.1	184.6	20.0	122.1	11.4	EC
6	9B-2-1	816.8	7107.7	100.3	20.4	14.8	147.8	185.9	18.3	114.0	10.3	EC
7	9B-2-1	1172.7	9245.5	125.8	23.3	11.1	190.1	217.1	24.6	125.7	11.5	EC
8	9B-2-1	1524.8	10919.3	295.5	33.5	15.9	195.4	206.1	19.2	129.3	15.5	EC
9	13A-2-2	958.2	7305.7	101.1	14.4	10.9	157.1	186.2	21.7	114.2	11.0	EC
10	13A-2-2	1220.2	7410.4	156.0	19.4	11.1	166.3	187.2	16.8	115.0	12.4	EC
11	13A-2-2	1079.2	7823.0	128.4	13.9	11.9	161.3	200.8	19.9	130.1	14.3	EC
12	13A-2-2	1230.6	7511.6	106.7	19.6	18.7	173.0	185.0	17.6	117.2	11.0	EC
13	13A-2-2	1031.6	6606.9	104.5	16.3	14.8	163.6	182.0	17.4	128.0	10.5	EC
14	13A-2-2	1351.8	8249.5	192.4	25.0	19.2	176.4	204.6	21.7	141.4	11.6	EC
15	13A-2-2	969.0	8004.2	165.0	17.5	8.7	175.3	200.0	21.2	115.6	7.4	EC
16	13A-2-2	1251.2	8731.5	180.4	25.8	15.8	184.1	212.1	20.1	127.2	9.9	EC
17	13A-2-2	1207.8	8394.2	152.2	28.2	14.7	174.2	196.7	21.3	128.2	12.7	EC
18	13A-2-2	706.1	9710.9	165.7	15.5	15.4	147.9	266.1	12.5	118.3	8.4	SMJ
19	13A-2-2	1149.6	8714.1	195.4	25.1	13.5	169.8	204.0	18.2	116.5	10.1	EC
20	13A-2-2	928.7	8843.8	177.9	19.4	15.2	181.8	212.2	22.2	118.3	10.6	EC
21	13A-2-2	1280.1	9487.7	100.0	23.2	12.8	172.9	193.3	19.9	114.3	13.1	EC
22	13A-2-2	1246.4	11868.3	84.3	19.0	14.5	173.2	201.1	25.6	116.0	11.0	EC
23	13A-2-2	1357.0	9166.4	57.0	14.7	15.7	190.4	203.4	19.2	121.4	10.7	EC
24	13A-2-2	872.0	6795.8	49.0	11.9	12.0	145.7	169.3	18.6	118.4	14.9	EC
25	13A-2-2	424.9	6926.8	50.6	13.0	5.8	107.6	202.7	10.5	100.4	7.7	SMJ
26	13A-2-2	1000.7	7607.0	165.2	23.5	4.1	118.3	239.2	16.9	112.5	9.3	SMJ
27	9B-1-1	737.8	7107.5	80.3	15.0	9.7	106.7	237.1	16.6	120.1	9.3	SMJ
28	9B-1-1	1101.7	7766.5	166.5	15.8	15.3	164.9	192.9	18.0	114.4	10.3	EC
29	9B-1-1	543.7	7466.0	31.7	15.2	11.6	120.3	225.3	19.7	120.9	9.0	SMJ
30	9B-1-1	646.0	7616.1	117.0	19.5	16.0	125.5	234.8	16.6	123.8	10.9	SMJ
31	9B-1-1	545.5	6696.9	67.2	18.0	13.6	145.2	169.7	18.8	113.7	10.5	EC
32	9B-1-1	760.5	6797.5	50.5	15.6	9.6	105.0	232.9	14.2	122.2	9.3	SMJ
33	13A-2-1	882.0	6780.8	72.6	12.4	14.8	153.8	171.3	20.4	108.9	7.9	EC
34	13A-2-1	897.7	7526.6	109.9	19.8	16.5	160.9	190.6	21.0	125.1	12.5	EC
35	13A-2-1	971.1	7500.3	131.6	23.5	13.5	170.2	181.7	16.1	109.8	12.6	EC
36	13A-2-1	1061.8	9412.1	160.9	23.8	18.5	177.6	191.6	18.0	111.8	11.3	EC

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
37	13A-2-1	619.4	7718.8	124.0	19.5	6.8	116.4	240.6	13.1	125.2	9.2	SMJ
38	13A-2-1	1093.4	6200.2	82.1	15.9	9.7	147.3	172.2	22.2	117.3	9.7	EC
39	13A-2-1	1141.2	7274.2	123.4	21.7	17.3	170.4	186.3	16.5	118.2	10.5	EC
40	13A-2-1	968.7	8176.9	144.7	24.8	15.6	173.9	196.0	14.7	115.1	12.5	EC
41	13A-2-1	930.7	9062.8	173.9	21.4	11.2	177.5	196.6	17.2	126.6	11.3	EC
42	9B-3-1	713.7	9405.3	129.0	21.6	4.9	106.8	185.9	15.1	168.7	7.9	IX
43	9B-3-1	871.8	6811.2	57.0	16.5	9.9	115.0	216.7	18.4	113.3	10.0	SMJ
44	9B-3-1	912.9	8707.3	155.2	14.6	8.4	117.4	236.1	17.0	113.9	12.4	SMJ
45	9B-2-2	653.1	6934.0	54.7	16.3	9.9	113.0	215.3	15.1	110.0	9.5	SMJ
46	9B-2-2	786.2	6529.8	95.5	17.6	9.1	106.9	212.0	16.5	113.2	8.4	SMJ
47	9B-2-2	811.7	7033.7	89.3	19.1	11.4	124.9	244.2	16.6	112.4	11.8	SMJ
48	9B-2-2	658.5	6855.2	30.7	16.2	5.2	114.0	216.3	16.7	111.6	8.7	SMJ
49	9B-2-2	1050.6	6101.2	75.1	19.2	12.7	151.9	176.8	21.0	122.4	10.1	EC
50	9B-2-2	872.9	7515.9	76.5	18.2	7.0	122.9	245.9	14.0	130.1	11.5	SMJ
51	9B-2-2	583.9	7257.9	43.2	14.8	11.4	108.6	217.6	16.3	121.2	7.9	SMJ
52	9B-2-2	685.4	7220.0	88.9	15.5	10.9	118.2	238.6	14.9	116.4	9.0	SMJ
53	9B-2-2	747.5	7188.6	54.3	14.6	10.8	117.2	229.2	15.2	116.5	8.5	SMJ
54	9B-2-2	649.4	7636.3	101.7	20.4	9.9	123.4	231.3	15.4	114.7	10.8	SMJ
55	9B-2-2	1045.0	8148.6	153.8	20.6	9.8	136.1	265.3	13.5	123.4	9.6	SMJ
56	9B-2-2	1070.3	7577.2	96.5	22.8	7.2	124.5	230.3	14.4	129.1	7.9	SMJ
57	14A-1-3	843.0	7271.0	51.0	15.3	12.2	164.9	186.6	16.7	118.0	11.4	EC
58	14A-1-3	733.0	6801.8	94.6	14.9	12.8	148.0	185.7	19.6	114.7	9.7	EC
59	14A-1-3	824.2	7781.2	74.1	15.5	8.1	114.8	239.2	14.8	119.1	12.0	SMJ
60	14A-1-3	559.2	6436.6	51.8	11.6	12.9	95.9	208.3	14.0	112.0	7.7	SMJ
61	14A-1-3	657.3	8008.8	47.5	16.9	9.5	121.3	244.4	13.5	116.2	8.5	SMJ
62	14C-1-2	704.2	8949.3	151.6	24.6	12.8	128.1	261.9	16.5	128.6	11.2	SMJ
63	14C-1-2	506.6	7708.7	86.4	14.9	12.8	124.9	239.9	18.4	123.2	9.4	SMJ
64	16A-1-2	843.9	7378.6	94.2	17.2	11.1	123.1	241.9	18.7	125.7	8.6	SMJ
65	16A-1-2	814.3	7529.4	60.3	23.0	13.3	165.7	192.4	18.8	116.7	16.2	EC
66	16A-1-2	839.2	6448.6	48.8	15.4	15.2	158.6	169.3	17.1	114.6	8.6	EC
67	16A-1-2	1037.6	7204.6	49.8	12.0	12.8	157.7	190.3	24.2	111.0	10.5	EC
68	16A-1-2	740.0	8261.5	73.6	13.4	10.5	126.3	227.0	17.6	120.8	9.4	SMJ
69	16A-1-2	892.8	6955.1	62.5	22.2	9.3	160.3	187.2	17.5	117.0	12.1	EC
70	16A-1-2	825.4	6551.5	50.8	17.9	9.6	157.0	180.9	22.5	126.1	12.4	EC
71	16A-1-2	1130.5	7806.3	65.4	17.7	13.8	170.4	181.0	19.9	131.7	8.1	EC
72	16A-1-2	798.8	7440.2	105.0	15.8	12.2	170.9	189.9	21.1	115.1	9.9	EC
73	16A-1-2	809.1	6893.5	66.3	16.8	9.1	111.9	223.9	12.5	117.0	9.8	SMJ
74	16A-1-2	621.3	8086.1	120.2	18.6	9.6	123.7	237.7	15.7	112.9	8.9	SMJ
75	16A-1-2	668.7	7596.5	34.3	18.3	12.6	117.0	238.9	16.5	118.2	6.7	SMJ
76	16A-1-2	712.5	7481.0	178.0	17.9	14.7	137.7	177.5	20.0	104.2	11.2	EC
77	16A-1-2	810.9	8924.4	135.5	17.5	7.9	115.0	238.7	11.0	117.1	8.2	SMJ
78	16A-1-2	883.3	7748.9	159.2	13.5	12.7	118.4	235.6	11.7	115.7	11.1	SMJ
79	15A-2-1	612.9	7832.3	69.2	16.6	12.1	117.6	230.1	19.2	125.4	7.8	SMJ
80	15A-2-1	1445.9	10212.1	188.9	22.8	12.5	150.3	264.2	15.4	129.9	9.2	SMJ
81	17A-1-2	1007.7	6927.3	37.3	18.1	11.1	147.6	180.1	23.4	112.7	9.2	EC
82	17A-1-2	434.8	5240.2	97.9	15.6	3.3	117.7	134.9	14.1	85.7	6.4	EC
83	17A-1-2	652.6	7880.0	69.8	14.4	9.0	116.7	215.5	19.3	115.9	8.0	SMJ
84	13A-1-1	764.0	6998.4	60.6	15.2	11.8	146.7	184.8	15.4	116.2	11.0	EC

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
85	14C-1-1	924.6	6641.0	45.4	14.9	11.3	147.3	172.1	19.6	113.8	10.1	EC
86	14C-1-1	849.3	12569.6	90.7	16.3	13.1	101.0	213.6	21.4	206.1	10.4	IX
87	14A-1-2	916.8	7262.2	64.4	20.1	9.7	112.2	225.1	18.8	113.5	7.6	SMJ
88	14A-1-2	725.1	7901.1	63.4	19.5	10.2	119.2	241.7	13.9	120.4	8.5	SMJ
89	14A-1-2	995.8	7301.0	83.0	15.6	17.0	152.7	176.1	15.7	117.0	15.8	EC
90	14A-1-2	1054.9	7374.0	58.1	12.6	14.4	168.4	187.4	15.5	119.7	11.8	EC
91	14A-1-2	723.6	7116.5	40.4	20.5	12.8	156.4	180.3	19.4	116.5	11.6	EC
92	14A-1-2	659.4	7070.3	70.7	15.4	19.2	143.7	174.8	25.7	122.0	11.3	EC
93	14A-1-2	1128.6	6111.0	72.6	20.0	11.3	147.4	168.1	16.9	111.1	9.9	EC
94	14A-1-2	681.6	7719.9	120.4	18.3	7.3	113.4	236.7	17.5	114.8	7.1	SMJ
95	14A-1-2	514.0	7255.4	123.6	15.9	5.4	108.4	223.7	16.4	105.0	8.8	SMJ
96	14A-1-2	487.7	9522.1	95.0	16.6	7.9	123.5	155.8	23.5	136.5	8.2	UK
97	17A-1-1	925.4	7154.3	75.0	16.5	15.3	168.7	198.5	19.4	119.9	10.3	EC
98	6F-6-1	910.7	6469.2	41.6	19.1	14.2	151.1	170.9	19.6	113.8	11.2	EC
99	6F-6-1	748.1	6545.4	58.5	14.8	8.8	157.7	174.3	19.5	124.3	15.3	EC
100	6F-6-1	886.2	6967.6	57.4	15.4	14.7	115.4	227.1	18.8	115.8	11.3	SMJ
101	6F-6-1	1132.4	7006.8	71.3	21.3	12.1	161.1	188.2	22.2	120.4	9.2	EC
102	6F-6-1	746.9	8089.2	104.1	17.9	10.9	122.0	235.8	16.3	126.9	8.3	SMJ
103	6F-6-1	577.0	6173.3	54.6	16.9	14.4	137.4	168.9	17.9	109.7	14.7	EC
104	6F-1-1	585.3	7097.6	76.9	18.8	8.1	115.1	227.4	20.5	116.7	11.1	SMJ
105	6F-1-1	972.2	6689.8	47.3	16.1	12.6	159.3	188.4	19.8	122.5	9.4	EC
106	6F-1-1	1001.8	7461.0	44.0	11.4	18.6	169.8	192.4	17.4	118.3	11.5	EC
107	6F-1-1	1008.9	7365.4	50.5	20.2	13.3	162.9	194.7	28.4	128.0	13.5	EC
108	6F-1-1	964.5	7164.4	36.3	12.0	8.0	160.8	195.1	22.4	121.0	8.8	EC
109	6F-1-1	1176.5	10553.8	67.1	16.2	13.7	135.9	266.0	22.3	132.5	11.3	SMJ
110	6F-1-1	822.7	7454.1	56.9	21.0	15.5	110.5	231.6	12.8	115.6	11.9	SMJ
111	6F-1-1	735.9	7420.6	59.2	14.0	15.8	148.0	173.6	24.0	119.1	8.5	EC
112	6F-3-1	1088.9	6651.7	94.9	18.2	8.9	150.7	177.4	22.8	122.6	10.3	EC
113	6F-3-1	754.0	5922.4	58.3	13.7	10.1	150.3	165.2	15.2	119.0	10.4	EC
114	6F-3-1	815.4	7011.2	43.5	16.7	6.6	143.7	182.6	19.5	112.3	13.6	EC
115	6F-10-1	890.6	6892.7	56.4	15.2	6.8	152.0	189.5	19.0	117.4	14.2	EC
116	6F-10-1	1001.8	6586.5	117.5	19.2	7.3	162.6	183.9	21.3	122.7	9.0	EC
117	6F-10-1	1001.8	6586.5	117.5	19.2	7.3	162.6	183.9	21.3	122.7	9.0	EC
118	6F-10-1	489.5	11615.1	137.6	22.0	6.6	107.7	190.7	18.0	167.4	6.1	IX
119	6F-10-1	347.6	7962.1	91.1	8.2	6.4	122.1	236.7	13.7	106.5	7.3	SMJ
120	6F-10-1	835.8	7722.0	56.9	13.2	7.0	119.1	239.0	21.0	122.1	8.6	SMJ
121	6F-10-1	522.2	6628.1	80.6	12.9	6.2	96.8	213.8	14.3	97.0	9.6	SMJ
122	6F-10-1	455.0	7184.3	59.6	20.2	10.5	140.8	162.6	19.7	113.5	12.0	EC
123	6F-12-1	741.1	6388.9	75.1	14.1	13.0	143.3	177.9	22.1	114.0	10.4	EC
124	6F-12-1	909.2	6854.6	64.5	19.3	11.4	162.0	179.8	21.2	118.8	11.5	EC
125	6F-12-1	853.4	7649.9	51.3	17.5	15.7	159.6	207.9	20.5	118.6	9.7	EC
126	6F-12-1	895.1	6837.3	66.3	19.0	9.5	114.0	241.8	16.7	116.1	10.0	SMJ
127	6F-12-1	40.4	1740.0	87.0	12.8	-7.2	4.4	8.4	-2.9	15.0	1.0	UK
128	6F-7-1	1138.3	7702.1	167.5	19.5	21.0	165.1	201.9	21.2	133.7	11.0	EC
129	6F-7-1	562.3	7546.2	86.8	19.8	6.7	145.3	177.6	21.2	116.4	13.1	EC
130	6F-7-1	751.5	6444.1	84.3	18.0	13.1	150.3	177.8	16.2	117.0	10.9	EC
131	6F-8-1	720.8	6836.2	58.0	20.7	8.2	111.9	226.4	14.0	114.4	8.3	SMJ
132	6F-8-1	960.2	7645.5	85.5	17.2	9.3	127.2	237.0	12.0	124.1	10.1	SMJ

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
133	6F-4-1	797.1	7132.4	54.1	15.1	8.9	152.1	186.7	21.6	117.7	7.2	EC
134	6F-4-1	709.4	7528.3	119.9	19.1	9.8	123.0	239.5	15.9	118.4	9.3	SMJ
135	6F-4-1	746.8	7270.2	88.7	17.3	12.4	154.8	190.8	17.3	117.1	9.8	EC
136	6F-4-1	962.9	7103.1	142.1	17.0	16.0	162.6	198.5	17.0	117.4	10.9	EC
137	6F-4-1	1032.1	6882.2	115.8	19.8	14.3	150.2	178.2	19.9	120.0	7.1	EC
138	6F-4-1	875.5	7766.6	181.0	18.2	16.5	118.4	245.9	18.1	110.1	6.4	SMJ
139	6F-5-1	649.4	7122.1	83.6	13.6	6.7	144.5	174.8	23.5	114.6	7.9	EC
140	6F-5-1	756.0	7124.5	50.6	13.3	10.7	203.5	188.8	13.5	116.6	9.8	UK
141	6F-5-1	837.9	8104.3	103.6	20.1	14.8	167.6	197.3	19.3	129.4	10.9	EC
142	6F-5-1	894.3	7028.1	136.3	16.1	7.8	140.3	177.8	23.6	111.8	9.0	EC
143	6F-5-1	800.0	6384.0	91.2	17.7	8.1	154.9	172.6	15.9	122.5	11.7	EC
144	6F-5-1	802.2	7345.0	54.0	16.7	10.6	111.5	228.6	11.7	119.8	9.7	SMJ
145	6F-9-1	789.3	9448.0	123.1	21.6	10.5	136.1	258.3	15.0	124.3	10.2	SMJ
146	6F-9-1	814.4	6789.4	99.8	16.7	9.0	147.9	175.8	24.8	117.8	9.0	EC
147	6F-9-1	1366.0	10016.3	224.8	26.9	21.0	175.5	188.7	19.8	122.9	11.5	EC
148	6F-2-1	854.7	7049.0	59.9	17.3	9.8	118.5	229.9	15.9	123.8	10.1	SMJ
149	6F-2-1	1204.2	7990.0	77.2	22.5	17.4	163.7	190.0	20.9	117.3	11.3	EC
150	6F-2-1	769.0	6803.6	49.5	17.0	14.9	159.4	177.9	17.6	110.6	13.4	EC
151	6F-2-1	689.2	6485.6	50.8	16.6	11.9	147.0	157.6	18.1	106.0	7.5	EC
152	6F-2-1	507.9	6778.5	89.7	14.0	5.0	106.0	220.3	15.5	109.4	7.2	SMJ
153	6F-2-1	872.1	8183.3	74.5	15.4	12.5	176.1	190.7	21.5	127.1	12.0	EC
154	6F-2-1	895.3	8326.5	84.1	13.5	9.1	129.6	237.2	14.6	127.1	9.1	SMJ
155	6F-2-1	887.4	6053.1	47.6	7.5	8.2	136.5	179.1	17.0	105.0	9.6	EC
156	6F-2-1	729.9	7345.0	79.7	11.8	10.9	121.4	245.6	16.1	120.7	8.0	SMJ
157	6F-2-1	563.9	7079.6	83.6	14.4	4.4	107.2	216.8	17.3	113.9	6.5	SMJ
158	6F-2-1	1005.6	7216.3	56.7	14.1	17.3	155.5	186.7	18.0	122.9	10.0	EC
159	6F-2-1	813.0	8054.2	67.0	20.3	7.3	127.2	258.7	17.4	123.2	11.4	SMJ
160	6F-2-1	474.6	8558.1	133.4	21.8	8.7	153.2	184.2	20.3	119.0	10.5	EC
161	6F-2-1	959.8	7730.8	173.4	18.2	18.2	174.5	197.0	20.6	121.1	11.0	EC
162	6F-2-1	1259.8	8847.8	44.2	21.8	6.5	185.1	209.3	25.1	121.9	11.6	EC
163	6F-2-1	741.3	9128.1	281.3	25.0	1.9	114.9	223.0	13.8	107.8	8.4	SMJ
164	6F-2-1	1264.3	9500.4	134.5	23.3	7.3	133.3	256.5	10.1	107.9	11.7	SMJ
165	3B-1-1	952.5	6309.1	61.5	15.3	7.6	155.4	173.5	16.6	116.1	11.2	EC
166	3B-1-1	921.0	6744.8	53.1	13.2	10.6	151.9	167.4	20.9	115.7	9.0	EC
167	3B-1-1	968.0	7160.0	54.5	16.6	12.9	161.6	198.7	14.3	114.9	12.0	EC
168	3B-1-1	1005.1	6770.0	61.8	22.0	13.6	166.5	186.7	21.4	119.6	11.4	EC
169	3B-1-1	936.8	6253.4	50.1	11.1	14.8	137.3	174.9	17.6	111.7	10.7	EC
170	3B-1-1	844.4	7056.2	51.5	15.0	10.0	151.2	180.7	20.1	123.2	11.3	EC
171	3B-1-1	845.5	6534.1	60.2	17.5	10.4	142.4	166.2	19.5	108.2	7.5	EC
172	3B-1-1	863.2	6859.5	44.2	14.9	12.0	154.0	176.3	26.2	116.3	9.9	EC
173	3B-1-1	849.2	7904.6	48.9	16.7	11.7	129.3	217.2	17.2	115.1	9.4	SMJ
174	1H-8-4	1020.3	6741.9	38.8	15.9	16.3	150.5	183.5	21.9	114.2	9.0	EC
175	1H-8-4	1027.9	7798.1	57.9	17.8	15.0	175.6	186.5	20.2	127.7	9.5	EC
176	1H-8-5	485.3	7396.5	69.3	16.1	9.0	111.9	227.7	16.7	118.0	10.7	SMJ
177	1H-8-5	823.2	6846.3	58.4	12.3	10.1	116.9	238.6	13.0	115.6	11.5	SMJ
178	1H-8-5	811.9	7341.4	67.1	20.9	16.1	119.9	244.1	19.0	127.6	8.6	SMJ
179	1H-8-5	834.9	7028.4	32.2	11.9	10.0	128.7	233.7	14.6	126.3	10.2	SMJ
180	1H-12-1	749.8	7841.9	71.2	17.8	11.3	121.4	246.3	13.7	127.2	6.8	SMJ

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
181	1H-12-1	893.7	6668.0	67.5	12.2	15.2	165.9	183.1	21.7	120.1	14.1	EC
182	1H-12-1	1117.4	8244.1	59.5	16.4	14.4	168.8	212.6	21.7	115.5	12.7	EC
183	1H-12-1	779.0	7339.3	42.4	19.9	7.1	118.9	249.7	15.6	124.0	9.7	SMJ
184	1H-12-1	862.2	4775.3	59.8	14.3	5.7	126.5	153.2	18.2	98.5	8.7	EC
185	1H-12-1	859.7	6210.8	54.4	22.5	10.6	120.4	37.3	12.1	70.5	12.9	UK
186	1H-12-1	838.7	8448.5	43.1	17.0	6.6	102.3	211.6	14.5	107.4	8.8	SMJ
187	1H-1-1	802.3	7687.5	52.1	15.1	9.8	150.9	188.6	22.5	119.4	11.0	EC
188	1H-1-1	896.0	7876.9	126.9	23.9	14.4	172.8	199.0	23.3	124.3	10.7	EC
189	1H-1-1	751.5	7027.8	62.3	14.5	14.7	157.4	177.5	17.9	119.5	11.2	EC
190	1H-1-1	764.7	6737.5	35.8	19.5	6.9	150.3	184.9	20.8	112.1	8.6	EC
191	1H-1-1	737.9	6378.8	36.9	14.3	10.1	146.0	174.7	22.0	118.9	10.9	EC
192	1H-1-1	787.9	7328.4	88.3	19.0	10.6	119.8	246.4	17.8	124.5	10.6	SMJ
193	1H-1-1	428.3	10468.8	78.6	17.0	3.7	110.9	190.4	18.1	180.5	12.3	IX
194	1H-1-1	747.1	7352.6	112.3	15.1	11.1	109.5	230.2	13.4	114.3	7.2	SMJ
195	1H-1-1	808.4	6784.7	51.6	15.5	5.8	111.7	233.2	18.1	115.6	12.7	SMJ
196	1H-8-6	900.8	6299.4	90.2	17.4	15.2	110.1	211.7	10.4	113.9	9.7	SMJ
197	1H-8-6	718.7	9502.8	98.5	21.2	11.8	129.3	265.0	18.4	128.0	10.3	SMJ
198	1H-8-6	689.1	6646.9	82.5	20.6	5.2	104.5	225.7	14.1	118.0	10.3	SMJ
199	1H-5-1	924.4	6668.0	65.9	15.7	14.3	150.8	181.4	21.1	121.1	13.0	EC
200	1H-5-1	874.4	7337.9	64.8	21.3	13.4	158.4	187.0	17.1	116.7	12.9	EC
201	1H-5-1	1014.4	6870.2	109.0	21.6	8.5	164.0	191.0	19.2	115.0	13.7	EC
202	1H-5-1	860.6	6499.4	100.2	15.8	10.7	157.6	185.5	19.9	111.7	8.3	EC
203	1H-5-1	1025.2	7213.2	46.9	16.2	8.1	114.5	226.8	18.4	124.1	11.6	SMJ
204	1H-5-1	905.1	7330.3	62.3	19.6	15.0	156.7	182.6	21.0	128.8	11.8	EC
205	1H-5-1	738.8	5886.2	94.3	15.5	10.8	134.0	167.9	19.6	107.7	9.3	EC
206	3B-1-2	1079.8	7012.1	41.2	18.2	12.9	154.6	182.5	31.1	119.5	11.3	EC
207	3B-1-2	813.9	7167.1	71.0	15.9	10.6	164.0	184.1	21.0	121.0	10.6	EC
208	3B-1-2	843.0	7282.9	62.2	9.7	12.7	116.7	242.8	18.3	121.4	9.5	SMJ
209	3B-1-2	842.4	6800.0	37.3	10.1	9.1	152.4	197.4	21.1	114.2	11.2	EC
210	3B-1-2	952.8	7300.6	66.5	20.9	11.8	164.1	200.2	17.4	127.4	8.9	EC
211	3B-1-2	777.8	8136.8	104.2	17.4	7.3	129.6	239.8	20.4	127.2	9.0	SMJ
212	3B-1-2	739.4	8110.0	70.7	12.7	10.9	123.2	221.1	17.6	116.0	9.3	SMJ
213	3B-1-2	1124.0	7181.2	85.5	18.2	13.4	165.3	205.9	20.5	121.4	11.2	EC
214	3B-1-2	564.0	6928.3	119.9	15.4	6.1	120.0	222.2	20.0	112.8	8.3	SMJ
215	3B-1-2	601.3	7390.9	75.2	13.7	14.3	110.9	224.0	14.0	114.8	9.4	SMJ
216	3B-1-2	571.8	8034.1	116.8	16.8	11.5	125.0	244.8	17.6	121.3	10.2	SMJ
217	3B-1-2	902.9	7825.6	118.7	20.4	9.4	133.0	254.3	16.5	125.6	12.3	SMJ
218	3B-1-2	772.7	7024.8	100.3	17.7	15.4	154.0	180.0	19.9	123.9	12.4	EC
219	3B-1-2	977.1	8575.8	135.6	25.0	9.7	131.7	254.8	19.7	122.9	7.5	SMJ
220	3B-1-2	886.4	10524.4	149.3	22.4	12.5	146.6	267.7	18.5	118.6	12.0	SMJ
221	3B-1-2	874.9	6585.6	81.6	11.6	8.3	104.6	208.0	13.9	112.0	8.5	SMJ
222	3B-1-2	874.9	6585.6	81.6	11.6	8.3	104.6	208.0	13.9	112.0	8.5	SMJ
223	3B-1-2	904.2	7753.0	102.6	17.8	8.2	124.7	251.2	14.4	115.1	6.3	SMJ
224	1J-1-1	941.3	6487.7	40.3	17.6	5.2	112.1	234.2	13.1	117.5	8.9	SMJ
225	1J-1-1	712.9	7867.8	107.8	19.9	10.0	138.0	248.9	19.4	129.1	9.5	SMJ
226	1J-1-1	1065.8	6974.6	69.3	14.8	12.3	167.2	185.3	23.1	117.1	9.3	EC
227	1J-1-1	783.1	6860.7	50.7	15.8	11.6	121.4	236.5	11.6	118.9	11.1	SMJ
228	1J-1-1	727.3	7058.6	75.2	15.0	7.3	106.9	235.7	18.5	110.6	6.5	SMJ

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
229	1J-1-1	727.3	7058.6	75.2	15.0	7.3	106.9	235.7	18.5	110.6	6.5	SMJ
230	1J-1-1	1198.4	8576.6	103.5	20.2	15.7	162.0	197.1	20.2	127.5	11.6	EC
231	1F-1-1	815.8	7798.6	54.4	15.6	9.1	120.6	231.0	15.7	113.2	9.6	SMJ
232	1F-1-1	791.7	7304.1	61.0	12.4	8.4	99.8	223.2	19.8	116.1	10.8	SMJ
233	1F-1-1	735.7	6736.2	43.9	18.1	8.0	153.9	187.0	19.5	112.6	9.6	EC
234	1F-1-1	874.3	7209.0	52.6	20.5	7.7	160.1	186.8	18.2	119.8	10.5	EC
235	1F-1-1	1006.5	7011.7	65.8	16.1	16.2	162.4	197.5	23.3	118.7	10.9	EC
236	1F-1-1	803.9	7544.8	40.2	20.1	8.4	122.6	226.3	15.4	125.5	6.3	SMJ
237	1F-1-1	1074.7	6697.0	52.8	17.6	17.3	159.4	188.5	23.8	120.6	11.1	EC
238	1F-1-1	843.6	7093.9	82.1	18.1	14.8	162.2	185.3	18.4	114.8	10.3	EC
239	1F-1-1	1238.0	8299.0	70.2	16.0	7.5	189.3	210.6	14.3	127.9	10.8	EC
240	1F-1-1	914.5	7138.2	70.8	13.4	17.1	162.8	198.3	15.5	122.0	12.1	EC
241	1F-1-1	570.8	8839.3	77.0	19.0	15.4	130.2	261.1	15.7	117.4	13.4	SMJ
242	1F-1-1	1171.3	7213.4	64.1	14.5	21.8	166.4	188.0	18.2	122.4	10.6	EC
243	1F-1-1	864.8	8391.1	57.1	13.0	13.5	142.9	256.8	17.4	120.6	10.1	SMJ
244	1F-1-1	775.2	8285.6	66.6	19.5	10.2	118.4	244.5	12.8	119.7	10.5	SMJ
245	1F-1-1	863.7	7716.6	78.0	20.4	8.0	126.5	245.7	17.6	133.2	11.0	SMJ
246	1J-1-4	613.7	8090.4	48.5	12.3	8.7	122.8	234.2	10.0	121.3	8.2	SMJ
247	1J-1-4	781.1	7658.4	43.0	15.4	10.2	119.5	223.1	14.1	115.1	8.2	SMJ
248	1J-1-4	776.8	7163.0	63.2	15.4	12.2	166.0	193.5	20.7	112.3	12.5	EC
249	1J-1-4	974.3	6676.3	51.4	16.7	16.1	147.0	182.6	21.5	111.7	12.0	EC
250	1J-1-4	926.4	6835.0	50.0	17.5	14.0	154.6	190.8	18.7	132.3	8.8	EC
251	1J-1-4	758.8	6985.8	48.9	13.6	5.3	117.3	226.1	13.5	114.9	9.2	SMJ
252	1J-1-4	810.1	9721.2	41.8	17.1	9.1	105.9	200.9	14.6	172.6	10.4	IX
253	1J-1-4	1424.2	11286.9	118.6	13.5	10.2	165.4	289.1	14.0	125.9	11.4	SMJ
254	1H-9-2	965.4	6403.9	71.5	18.3	12.2	159.2	173.2	19.6	121.0	12.2	EC
255	1H-9-2	922.3	7386.0	67.4	17.4	12.2	122.6	241.0	15.1	130.1	10.1	SMJ
256	1H-9-2	863.0	7232.9	52.4	20.8	11.1	153.7	175.7	19.1	117.4	11.2	EC
257	1H-9-2	757.9	7393.1	55.6	17.0	13.1	166.5	198.8	18.2	110.9	12.8	EC
258	1H-9-2	1115.2	6707.8	42.2	19.6	12.1	154.3	182.3	17.5	117.4	14.5	EC
259	1H-9-2	899.1	6915.4	52.7	11.8	10.6	159.1	192.9	15.6	116.2	9.1	EC
260	1H-9-2	856.9	7607.8	53.7	17.2	7.4	168.6	194.8	20.3	121.9	12.2	EC
261	1H-9-2	952.6	7229.3	52.2	19.0	8.3	161.4	189.7	20.2	124.0	9.4	EC
262	1H-9-2	644.5	8200.3	61.5	7.6	10.6	124.0	261.0	16.7	118.5	8.7	SMJ
263	1H-9-2	951.2	9196.7	57.7	14.8	11.9	134.8	279.9	17.5	129.9	12.1	SMJ
264	1H-9-2	803.3	8331.7	65.6	14.3	10.8	116.2	234.2	16.9	113.4	8.6	SMJ
265	1J-1-3	641.6	7906.1	42.1	14.7	11.4	114.1	227.8	19.6	127.8	9.5	SMJ
266	1J-1-3	782.6	6630.8	45.1	15.0	14.2	123.4	224.3	19.3	122.3	9.1	SMJ
267	1J-1-3	690.3	6550.3	49.9	21.2	15.0	147.1	182.6	18.7	113.5	8.9	EC
268	1J-1-3	804.3	6877.2	62.6	15.7	13.6	146.2	182.7	19.1	124.5	12.2	EC
269	1J-1-3	753.0	7279.1	68.8	20.1	8.1	131.1	241.1	14.4	115.7	7.8	SMJ
270	1J-1-3	817.2	8636.3	78.2	12.9	9.7	129.6	261.5	12.9	127.9	9.1	SMJ
271	1J-1-3	851.6	8682.4	121.1	20.2	17.2	166.8	202.1	22.8	125.2	12.4	EC
272	1J-1-3	638.3	8831.2	34.5	11.8	1.1	92.9	166.7	21.9	161.0	6.7	IX
273	1J-1-3	772.0	6886.5	26.9	18.3	11.5	124.6	223.8	16.6	113.7	7.5	SMJ
274	1J-1-3	950.4	7453.8	47.5	8.8	14.8	121.0	233.0	19.4	124.2	6.2	SMJ
275	1J-1-3	742.3	6844.0	56.1	16.5	9.7	114.2	226.4	18.5	113.4	9.0	SMJ
276	1J-1-3	761.9	8381.3	66.2	15.5	7.7	125.8	247.4	15.5	127.1	9.3	SMJ

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
277	1J-1-3	846.4	8634.3	50.3	13.5	10.3	122.2	243.5	17.4	127.6	10.6	SMJ
278	1J-1-3	516.9	11023.8	35.3	13.8	18.4	150.0	32.2	26.4	195.1	17.8	ZA
279	1H-9-1	910.9	7466.2	65.6	18.4	9.7	158.2	176.1	17.5	125.3	8.2	EC
280	1H-9-1	1063.8	7554.6	151.9	14.9	16.2	163.0	178.1	16.5	113.0	10.9	EC
281	1H-9-1	1012.1	7804.4	45.6	15.8	10.7	171.8	201.4	16.7	118.4	10.9	EC
282	1H-9-1	702.8	8228.2	135.3	12.7	5.7	122.3	258.5	17.7	131.4	7.5	SMJ
283	1H-9-1	588.3	7158.5	138.0	26.6	4.8	110.6	215.7	15.8	116.9	7.3	SMJ
284	1H-9-1	978.1	7240.8	52.5	18.0	15.1	163.1	183.4	20.0	113.6	10.9	EC
285	1H-8-2	1353.6	6975.7	80.2	18.2	18.7	168.1	188.4	21.9	119.8	12.1	EC
286	1H-8-2	988.2	6672.3	50.6	9.2	7.0	156.5	185.2	18.5	117.4	11.0	EC
287	1H-8-2	735.9	7643.9	56.5	11.4	12.6	109.7	227.7	18.4	118.7	9.6	SMJ
288	1H-8-2	1029.8	6752.6	61.9	21.0	7.1	165.9	198.8	20.7	120.9	12.2	EC
289	1H-8-2	1101.4	7564.8	42.8	15.3	18.5	167.9	196.2	21.9	125.9	10.5	EC
290	1H-8-2	993.9	6742.7	52.1	11.8	15.0	148.0	182.6	23.9	123.1	11.6	EC
291	1H-8-2	1165.1	8081.3	75.6	15.7	17.4	180.6	205.6	18.2	128.6	9.9	EC
292	1H-8-2	919.8	7641.2	51.8	17.3	16.2	165.7	178.7	18.3	120.3	8.7	EC
293	1H-8-2	1005.6	7818.9	52.0	13.8	13.0	125.0	269.4	18.6	122.2	10.6	SMJ
294	1H-8-2	840.8	6900.9	56.5	17.4	16.4	159.9	196.4	21.6	118.4	10.8	EC
295	1H-8-2	852.3	7050.6	50.2	19.4	8.2	168.2	182.8	17.7	118.4	9.3	EC
296	1H-8-2	974.0	7877.8	61.3	19.3	12.8	126.9	267.4	12.7	114.3	7.6	SMJ
297	1H-8-2	938.4	8181.6	46.2	18.9	13.9	119.7	238.7	13.0	120.2	8.2	SMJ
298	1H-8-2	774.9	6735.5	60.2	19.5	6.2	111.1	228.1	17.1	129.9	8.5	SMJ
299	1H-12-1	899.0	7276.8	64.3	16.8	11.1	158.1	182.6	16.7	130.7	13.1	EC
300	1H-12-1	828.4	6907.7	46.9	17.2	7.2	154.6	187.0	16.3	119.1	11.7	EC
301	1H-12-1	845.1	7905.7	76.2	13.8	8.6	167.5	179.1	22.8	120.4	11.7	EC
302	1H-12-1	698.5	7199.0	124.6	20.2	14.7	158.6	184.3	19.7	120.2	9.7	EC
303	1H-12-1	830.5	6911.6	108.6	20.2	15.3	163.9	179.0	20.5	121.4	11.9	EC
304	1H-12-1	838.5	7121.2	100.0	11.3	12.8	155.9	188.4	21.3	122.0	7.4	EC
305	1H-12-1	1252.3	6817.3	62.7	18.0	12.5	175.3	189.6	20.3	127.9	10.2	EC
306	1H-12-1	740.8	7561.6	56.8	12.2	12.8	124.3	259.0	17.7	128.6	11.7	SMJ
307	1H-12-1	1012.1	8078.8	71.6	15.3	16.2	170.0	184.1	17.1	121.6	10.3	EC
308	1H-12-1	1059.6	6374.6	39.3	14.3	6.5	157.7	166.6	18.7	116.2	14.3	EC
309	1H-12-1	799.5	8832.3	56.3	12.0	13.6	132.7	246.6	17.1	122.1	9.0	SMJ
310	1H-12-1	783.2	7890.0	64.6	19.5	15.2	175.0	199.5	19.0	131.9	13.3	EC
311	1H-12-1	804.0	7113.3	50.2	18.5	10.0	153.8	183.7	21.2	114.1	9.7	EC
312	1H-12-1	1128.4	7132.6	59.6	13.8	10.1	157.5	184.5	24.9	120.2	11.0	EC
313	1H-12-1	723.2	7818.6	37.4	13.2	11.1	124.0	243.8	15.1	124.0	9.3	SMJ
314	1H-12-1	1047.7	7502.1	41.1	13.8	15.5	122.7	253.6	19.7	118.5	10.1	SMJ
315	1H-12-1	699.6	7839.4	52.6	20.2	4.7	124.9	243.5	14.4	123.8	9.9	SMJ
316	1H-12-1	776.8	6192.2	50.2	11.7	9.8	136.2	162.1	17.1	107.3	9.5	EC
317	1H-12-1	739.3	6599.7	57.6	13.9	15.0	161.2	179.8	19.3	121.1	9.7	EC
318	1H-12-1	912.4	7379.4	58.3	18.4	12.1	108.1	234.5	15.3	121.2	9.5	SMJ
319	1H-12-1	811.0	6907.2	40.6	11.1	17.0	118.3	224.2	11.8	116.5	10.3	SMJ
320	1H-12-1	907.9	8596.6	72.4	21.5	14.8	118.6	251.0	17.2	119.6	6.7	SMJ
321	1H-12-1	1352.1	9657.2	59.1	21.1	20.6	185.2	209.1	25.1	123.8	10.7	EC
322	1H-12-1	1066.9	9410.8	75.5	19.0	14.5	141.9	266.3	16.2	132.7	8.7	SMJ
323	1F-1-4	867.4	6098.8	60.2	15.8	11.8	152.5	184.8	18.0	119.4	8.0	EC
324	1H-1-2	834.0	6768.8	57.2	15.1	11.7	153.4	185.3	22.3	120.7	9.1	EC

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
325	1H-1-2	937.7	7012.3	39.7	16.7	16.4	155.3	181.8	17.6	118.2	12.2	EC
326	1H-1-2	842.8	6986.8	52.1	14.4	13.5	175.4	191.3	20.8	126.3	15.5	EC
327	1H-1-2	1141.0	7625.9	58.6	18.8	12.2	159.1	198.1	22.2	123.8	10.7	EC
328	1H-1-2	728.2	7170.9	58.9	19.2	7.8	168.4	189.8	21.3	129.4	12.1	EC
329	1H-1-2	683.6	6575.1	43.2	17.5	15.1	159.4	186.2	14.8	112.0	12.6	EC
330	1H-1-2	653.4	7974.8	59.8	14.5	4.6	125.2	239.6	17.4	118.5	10.2	SMJ
331	1H-1-2	800.1	7698.1	26.8	9.6	14.7	156.1	183.1	26.6	117.5	9.8	EC
332	1H-1-2	687.5	8803.0	63.1	16.4	16.6	130.0	254.3	14.7	125.7	10.4	SMJ
333	1H-1-2	1135.1	6655.7	47.0	15.7	14.3	160.1	196.8	19.5	119.2	11.3	EC
334	1H-1-2	835.5	7545.5	39.0	11.6	6.8	124.6	262.6	15.6	121.4	11.7	SMJ
335	1H-1-2	1032.2	8221.0	66.9	13.9	15.2	160.3	191.0	22.7	119.3	10.6	EC
336	1H-1-2	754.6	7126.4	57.1	15.4	6.6	117.5	236.8	14.5	117.0	12.8	SMJ
337	1H-1-2	978.3	6990.2	44.7	14.8	7.3	119.4	229.6	15.1	126.0	7.8	SMJ
338	1H-8-3	778.3	7190.0	23.5	11.4	11.0	122.9	238.1	12.7	116.2	10.0	SMJ
339	1H-8-3	979.8	6636.7	63.4	18.1	16.8	150.8	195.6	22.3	119.7	12.4	EC
340	1F-1-2	1006.0	7623.2	71.3	17.8	14.9	165.6	191.4	20.4	116.4	9.6	EC
341	1F-1-2	712.1	7868.0	50.9	16.2	12.4	170.2	186.5	20.3	120.4	12.6	EC
342	1F-1-2	708.6	6695.3	31.3	21.0	14.1	150.4	179.0	21.5	118.5	10.5	EC
343	1F-1-2	901.1	7232.8	43.2	19.2	12.3	133.7	248.8	16.6	117.2	7.6	SMJ
344	1F-1-2	981.3	7122.4	59.5	12.7	17.8	162.5	176.5	25.4	121.5	10.9	EC
345	1F-1-2	813.4	6764.4	62.7	15.6	12.3	147.3	185.2	22.2	108.2	9.7	EC
346	1F-1-2	809.6	8347.5	61.4	13.5	10.0	155.1	179.7	14.0	113.4	12.4	EC
347	1F-1-2	990.4	7245.6	54.0	21.9	9.4	167.9	184.8	21.1	115.7	14.5	EC
348	1F-1-2	1209.1	9213.9	74.4	14.1	16.1	182.3	207.3	22.2	121.8	11.5	EC
349	1F-1-2	736.5	8560.8	58.5	18.2	8.1	118.4	242.8	14.7	116.9	10.4	SMJ
350	1F-1-2	908.8	7162.5	37.8	19.2	5.6	117.7	242.2	16.9	122.8	10.8	SMJ
351	1F-1-2	766.8	7289.0	45.4	14.5	13.5	108.5	228.7	15.1	120.8	10.8	SMJ
352	1F-1-2	687.2	8024.9	55.6	15.1	15.4	117.3	247.3	14.8	113.8	10.0	SMJ
353	1F-1-2	675.3	10001.5	49.1	13.3	14.7	109.3	199.0	18.9	168.9	9.3	IX
354	1F-1-2	753.9	7732.6	46.7	13.3	9.2	118.4	251.4	11.5	118.3	7.6	SMJ
355	1F-1-2	904.8	9011.0	77.7	19.1	11.3	136.0	265.7	12.0	133.1	9.0	SMJ
356	1F-1-2	907.5	7105.5	47.7	21.1	7.4	123.9	240.3	15.1	129.2	9.1	SMJ
357	1F-1-2	842.2	7649.8	61.7	17.1	6.7	127.6	254.9	13.8	132.5	7.2	SMJ
358	1H-1-3	1036.7	6732.7	42.1	15.7	15.2	151.7	182.0	20.0	117.7	13.0	EC
359	1H-1-3	1008.5	7393.0	69.4	16.1	15.0	154.3	183.7	22.7	131.8	10.1	EC
360	1H-1-3	856.6	7169.0	56.8	18.1	4.6	116.5	249.7	18.5	125.2	10.9	SMJ
361	1H-1-3	954.8	7091.9	32.9	21.4	15.3	159.1	179.3	23.7	122.3	9.7	EC
362	1H-1-3	1006.6	7687.3	117.2	20.2	11.6	170.1	194.3	19.6	121.5	11.6	EC
363	1H-1-3	1002.6	7491.9	67.7	13.5	17.5	156.3	202.4	24.4	124.9	10.2	EC
364	1H-1-3	1047.9	6944.8	34.4	16.9	10.6	154.5	186.3	17.3	122.7	9.5	EC
365	1H-1-3	856.5	8236.4	64.9	23.8	9.2	119.8	246.8	10.2	110.9	10.9	SMJ
366	1H-1-3	829.5	7471.0	39.4	15.5	11.6	170.7	184.4	22.0	123.4	11.3	EC
367	1H-1-3	766.7	8229.0	44.1	17.2	15.7	170.6	191.0	17.0	123.3	11.3	EC
368	1H-1-3	984.6	7418.8	66.2	11.8	13.0	168.0	196.5	18.1	118.4	10.1	EC
369	1H-1-3	949.6	7242.3	45.2	16.7	14.6	154.9	203.3	22.5	124.2	11.4	EC
370	1H-1-3	824.8	7050.7	64.4	15.8	16.1	166.8	187.8	21.0	129.0	14.0	EC
371	1H-1-3	910.6	6209.5	106.2	18.4	8.6	139.9	167.3	18.1	106.0	10.7	EC
372	1H-1-3	814.3	6039.1	42.3	12.9	9.9	138.9	178.1	17.8	114.1	9.2	EC

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
373	1H-1-3	1014.0	6202.8	77.9	16.7	16.4	147.3	186.7	17.1	116.4	11.6	EC
374	1H-1-3	995.4	6888.6	132.9	25.4	20.0	166.5	192.5	19.5	110.4	12.0	EC
375	1H-1-3	774.1	7902.5	56.7	17.1	4.5	105.8	238.9	13.1	121.6	8.6	SMJ
376	1H-1-3	832.9	6269.9	74.9	20.0	15.2	157.9	184.7	21.3	116.9	14.1	EC
377	1H-1-3	709.9	7109.6	56.7	19.6	8.3	114.2	229.2	15.7	117.6	9.8	SMJ
378	1H-1-3	477.0	8326.7	50.8	16.9	4.4	109.6	234.5	12.4	112.8	10.1	SMJ
379	1H-1-3	939.4	7535.3	34.7	14.3	14.8	161.1	188.9	17.3	119.6	11.7	EC
380	1H-5-2	1067.4	7288.8	61.9	17.5	8.6	164.5	206.4	19.3	121.6	11.3	EC
381	1H-5-2	769.0	7908.0	64.1	19.5	15.2	166.3	197.4	18.8	125.1	9.3	EC
382	1H-5-2	792.1	7168.5	63.3	17.2	9.5	155.8	185.5	21.0	119.1	10.5	EC
383	1H-5-2	965.8	7078.8	61.3	20.3	14.1	166.6	188.0	21.5	121.8	9.5	EC
384	1H-5-2	775.4	7237.1	61.4	20.8	17.5	157.2	189.8	23.3	122.8	10.6	EC
385	1H-5-2	948.0	8428.7	67.9	17.8	17.1	161.9	181.3	22.4	130.7	14.0	EC
386	1H-5-2	1543.1	9348.9	99.8	20.2	18.2	164.1	185.1	24.5	107.7	7.5	EC
387	1H-5-2	815.9	8354.9	31.7	21.0	14.6	181.8	188.1	17.1	116.6	8.5	EC
388	1H-5-2	752.6	7003.0	45.7	19.4	9.1	122.3	237.2	10.6	122.2	10.4	SMJ
389	1H-5-2	1090.2	6528.7	50.3	16.3	15.4	167.3	188.0	24.9	123.4	9.3	EC
390	1H-5-2	409.9	10086.1	30.4	12.5	7.7	93.7	192.3	14.8	160.6	9.4	IX
391	1H-5-2	886.9	7188.8	48.6	17.2	5.6	116.5	229.1	18.0	121.5	6.9	SMJ
392	1H-5-2	679.4	7943.8	55.5	20.7	8.4	120.0	240.3	15.3	119.2	9.8	SMJ
393	1H-5-2	1067.3	9708.9	75.2	12.2	9.1	123.4	255.9	11.6	116.1	13.0	SMJ
394	1H-5-2	969.4	8696.3	60.2	17.6	5.6	137.0	266.5	13.0	127.5	8.1	SMJ
395	1J-1-2	765.6	7612.9	57.4	21.5	10.4	123.3	243.5	15.3	122.5	10.7	SMJ
396	1J-1-2	623.9	7535.3	50.6	16.4	10.8	116.5	227.7	14.0	117.9	5.8	SMJ
397	1J-1-2	827.9	7453.5	114.5	15.1	10.8	159.3	178.3	15.5	113.2	11.9	EC
398	1J-1-2	648.4	7270.9	49.5	16.3	13.1	144.8	168.2	18.0	117.5	11.0	EC
399	1J-1-2	867.3	9026.8	64.1	14.0	6.2	180.9	197.3	23.8	130.3	11.8	EC
400	1J-1-2	603.3	7571.7	54.5	11.9	8.7	157.2	189.5	20.3	117.0	9.7	EC
401	1J-1-2	254.6	11083.9	57.6	13.4	16.5	138.4	28.9	32.1	193.9	19.6	ZA
402	1J-1-2	745.4	7179.0	58.5	16.9	4.2	117.3	228.8	16.4	112.7	10.2	SMJ
403	1J-1-2	763.5	7995.7	40.0	14.4	14.6	158.8	182.3	18.7	118.9	9.2	EC
404	1J-1-2	527.8	6575.5	17.7	11.1	8.5	105.0	207.6	14.1	104.4	6.7	SMJ
405	1J-1-2	674.4	6857.3	27.2	15.0	9.3	146.7	159.6	18.3	112.2	10.0	EC
406	1J-1-2	338.0	6709.2	45.2	13.7	5.4	98.4	201.1	10.8	104.9	8.0	SMJ
407	1J-1-2	642.1	7602.2	47.5	12.4	5.4	123.6	229.5	15.8	112.0	8.8	SMJ
408	1J-1-2	588.2	8091.4	46.2	15.5	6.5	119.3	240.0	15.8	117.0	7.8	SMJ
409	1J-1-2	588.2	8091.4	46.2	15.5	6.5	119.3	240.0	15.8	117.0	7.8	SMJ
410	1J-1-2	581.5	6049.3	27.3	14.4	6.6	128.4	158.3	12.2	104.7	10.3	EC
411	1J-1-2	307.3	11195.2	47.0	11.3	21.5	152.9	38.4	37.1	199.6	17.6	ZA
412	1J-1-2	535.4	7740.0	63.2	10.3	12.5	102.1	216.6	17.2	116.7	7.8	SMJ
413	1J-1-2	564.7	8741.1	44.6	18.1	5.6	114.0	229.7	12.0	113.6	6.3	SMJ
414	1J-1-2	454.7	8209.9	41.1	10.9	6.5	117.4	244.6	11.7	115.6	8.6	SMJ
415	1J-1-2	598.9	9147.1	72.9	16.8	9.5	115.5	223.4	12.8	112.1	8.2	SMJ
416	1J-1-2	397.3	7963.1	47.0	8.4	0.5	105.8	206.4	17.6	113.0	10.5	SMJ
417	1J-1-2	539.2	7333.5	27.7	12.3	4.3	137.3	161.8	19.0	110.7	7.9	EC
418	1H-1-4	588.5	6442.1	41.3	12.4	4.7	133.5	163.4	16.2	99.6	9.4	EC
419	1H-1-4	652.9	6787.3	59.4	14.1	7.8	145.0	163.0	21.5	110.6	10.7	EC
420	1H-1-4	770.0	7500.7	49.7	12.0	10.4	151.8	169.1	24.1	114.9	7.5	EC

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
421	1H-1-4	666.5	7654.4	26.5	15.4	3.8	110.7	215.5	14.0	113.6	5.1	SMJ
422	1H-1-4	524.2	6983.4	36.2	9.8	6.1	106.3	215.0	10.9	101.7	7.7	SMJ
423	1H-1-4	544.8	8951.8	35.1	14.5	9.9	114.8	249.1	16.6	114.9	9.0	SMJ
424	1H-1-4	679.0	6225.0	53.3	15.8	6.1	139.8	171.6	17.1	103.3	9.4	EC
425	8A-10-3	570.3	6876.3	9.3	14.4	15.1	139.7	164.1	20.3	117.8	9.8	EC
426	8A-10-3	334.3	6966.9	76.9	11.5	8.3	104.2	210.7	12.1	111.2	9.8	SMJ
427	8A-9-3	563.4	6321.6	29.8	10.2	10.6	141.8	168.3	15.8	113.8	8.9	EC
428	8A-9-3	533.5	7066.7	42.8	13.0	5.6	119.9	239.2	13.6	106.2	6.1	SMJ
429	8A-2-3	304.5	6284.2	28.6	9.4	8.5	141.1	158.9	15.7	109.1	8.1	EC
430	8A-2-3	481.5	8046.2	39.5	15.3	3.6	115.8	233.3	13.1	111.4	6.7	SMJ
431	8A-2-2	571.4	6224.0	27.5	12.6	6.1	139.8	152.2	20.6	103.2	9.2	EC
432	8A-2-2	422.4	5966.8	49.9	17.8	4.8	123.4	161.7	18.5	97.0	11.0	EC
433	8A-2-2	757.4	7146.5	55.7	18.1	7.1	149.5	188.8	17.0	103.0	10.9	EC
434	8A-2-2	436.1	7088.1	38.3	6.3	3.0	95.8	217.2	14.1	109.3	6.2	SMJ
435	8A-2-2	499.6	6740.2	34.4	16.3	11.8	104.3	210.3	15.1	100.1	6.7	SMJ
436	8A-2-2	410.2	7489.2	52.3	14.0	2.4	110.5	220.0	11.8	113.1	8.5	SMJ
437	8A-2-2	553.7	7176.4	42.9	11.8	10.0	146.8	174.6	14.5	102.8	10.1	EC
438	8A-2-2	426.6	7085.9	75.8	15.7	4.0	100.5	186.8	12.1	89.5	9.2	SMJ
439	8A-2-2	367.9	6888.3	37.3	9.8	7.0	101.4	203.3	14.4	98.4	6.5	SMJ
440	8A-2-2	405.7	7124.6	23.0	11.6	3.3	100.4	202.8	13.7	102.0	8.9	SMJ
441	8A-11-4	410.7	6154.8	50.6	11.3	5.1	105.1	207.3	10.7	98.8	8.7	SMJ
442	8A-11-4	306.1	7156.1	53.5	14.3	12.9	111.0	207.3	14.6	105.7	8.5	SMJ
443	8A-11-4	707.8	7759.2	60.8	15.9	14.1	114.3	233.1	12.6	99.7	9.3	SMJ
444	8A-6-1	489.0	6622.0	83.8	13.2	7.2	145.4	166.7	17.6	113.9	9.1	EC
445	8A-6-1	434.8	7211.2	99.7	12.1	6.8	110.9	213.9	13.5	107.5	8.7	SMJ
446	8A-6-1	568.6	7825.5	78.8	13.2	9.9	118.4	229.3	14.1	102.3	4.4	SMJ
447	8A-4-2	502.7	6039.2	79.4	12.0	5.1	127.1	154.1	18.4	101.1	10.0	EC
448	8A-4-2	490.2	6874.5	50.5	12.7	7.3	107.8	208.6	16.7	109.5	7.4	SMJ
449	8A-4-2	327.5	7669.5	70.3	7.5	7.1	102.3	215.5	12.5	97.1	5.8	SMJ
450	8A-4-2	496.4	8038.8	125.7	13.0	7.6	119.0	228.8	9.4	112.8	7.3	SMJ
451	8A-4-2	857.0	9292.3	196.7	20.9	5.1	137.0	229.7	16.3	115.0	8.1	SMJ
452	8A-4-2	386.4	7803.3	89.8	14.9	5.5	118.3	231.6	16.0	119.2	11.5	SMJ
453	8A-4-2	540.0	8432.3	88.9	13.1	4.1	102.8	220.7	12.4	116.0	8.4	SMJ
454	8A-4-2	378.0	6534.4	76.9	17.9	7.7	98.2	189.5	12.4	104.8	7.0	SMJ
455	8A-11-2	757.7	5937.6	104.7	11.0	7.6	127.9	155.6	21.4	106.2	8.3	EC
456	8A-11-2	545.8	7173.0	58.2	10.4	5.5	102.3	219.8	15.1	109.6	10.7	SMJ
457	8A-11-2	810.3	8230.7	144.7	16.0	4.6	152.2	175.8	18.2	112.8	10.0	EC
458	8A-11-2	826.9	7523.3	126.6	16.2	12.3	146.0	181.8	20.7	108.0	6.7	EC
459	8A-11-2	342.8	7325.1	24.9	14.7	8.6	110.2	220.7	11.0	112.4	6.2	SMJ
460	8A-11-2	630.5	7228.0	26.6	10.7	4.9	113.2	221.3	13.7	107.6	7.5	SMJ
461	8A-11-2	576.8	6939.6	55.0	11.1	7.1	103.7	215.1	9.0	107.3	9.2	SMJ
462	8A-7-2	561.5	5911.8	34.7	12.1	3.2	101.9	174.9	8.5	103.4	6.3	SMJ
463	8A-7-2	581.0	6486.1	60.6	17.3	16.2	135.2	162.3	18.7	102.1	9.6	EC
464	8A-7-2	660.0	7725.7	60.1	12.8	8.3	152.2	183.9	23.0	113.9	9.7	EC
465	8A-6-4	477.1	9861.6	33.9	15.3	2.4	101.4	176.9	15.5	161.6	7.7	IX
466	8A-6-4	613.3	6642.5	41.2	15.0	13.8	101.9	208.9	13.7	113.2	8.1	SMJ
467	8A-12-2	605.3	7074.7	74.0	13.3	8.2	106.2	203.3	16.7	108.6	6.7	SMJ
468	8A-12-2	815.4	6564.8	39.9	10.1	10.9	149.4	173.4	18.6	120.3	11.6	EC

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
469	8A-12-2	672.7	6855.4	142.8	12.1	8.2	102.0	212.5	18.2	107.6	6.6	SMJ
470	8A-12-2	461.0	7551.3	44.0	12.9	6.0	118.3	236.5	14.5	111.7	11.5	SMJ
471	8A-12-2	597.7	6694.3	18.9	13.7	5.9	142.3	171.8	19.7	110.4	10.7	EC
472	8A-12-2	597.7	6694.3	18.9	13.7	5.9	142.3	171.8	19.7	110.4	10.7	EC
473	8A-12-2	525.4	6603.4	46.5	13.7	8.6	99.8	203.6	15.3	110.8	7.7	SMJ
474	8A-12-2	817.5	6426.6	22.8	13.2	7.2	105.9	222.9	12.2	104.9	7.1	SMJ
475	8A-3-1	419.5	7158.6	52.5	10.4	11.3	108.7	219.4	15.3	116.0	10.3	SMJ
476	8A-3-1	648.4	7113.1	58.4	12.9	6.1	119.9	216.5	14.5	112.3	9.5	SMJ
477	8A-3-1	755.0	7114.8	52.1	12.0	2.2	114.5	220.7	14.6	113.0	6.5	SMJ
478	8A-11-3	654.7	5777.9	52.3	18.6	5.6	132.3	169.0	18.6	102.6	10.7	EC
479	8A-11-3	631.5	8118.4	37.4	15.2	6.8	110.9	221.9	14.8	113.9	5.3	SMJ
480	8A-11-3	700.9	7930.0	46.1	16.0	7.0	124.2	215.3	16.2	112.8	8.5	SMJ
481	8A-9-1	359.4	7379.1	42.3	9.4	6.1	110.7	223.8	10.0	108.1	8.3	SMJ
482	8A-2-1	487.1	6677.5	38.7	11.5	8.0	136.2	173.4	14.5	104.5	9.5	EC
483	8A-2-1	547.5	7325.6	26.7	12.8	4.6	104.9	207.7	14.9	105.7	5.7	SMJ
484	8A-2-1	472.5	7885.6	32.4	16.7	18.8	105.7	219.2	16.3	108.0	9.2	SMJ
485	8A-2-1	601.8	7838.8	48.5	11.2	4.3	118.4	247.6	9.8	115.3	7.9	SMJ
486	8A-4-1	535.1	7027.6	45.4	10.4	9.2	105.6	215.3	19.3	112.9	7.6	SMJ
487	8A-4-1	218.8	10660.8	48.5	15.5	16.9	148.1	33.3	32.2	191.1	14.6	ZA
488	8A-4-1	556.9	8192.4	47.7	16.5	9.5	112.6	226.3	18.3	117.8	5.5	SMJ
489	8A-4-1	478.1	6948.9	29.0	9.5	8.6	109.1	194.5	17.3	104.7	7.4	SMJ
490	8A-3-2	525.2	7089.7	57.5	11.0	5.1	108.0	224.7	13.5	108.8	9.2	SMJ
491	8A-3-2	413.4	10888.5	71.1	20.9	22.1	190.1	5.2	57.7	227.1	38.9	ZA
492	8A-3-2	476.2	7098.7	44.6	17.4	4.5	111.0	222.4	11.2	112.7	9.7	SMJ
493	8A-3-2	561.9	7202.3	30.7	14.5	12.7	124.3	231.2	13.3	103.6	11.0	SMJ
494	8A-3-2	565.0	7149.6	22.7	12.0	2.9	110.8	217.0	9.7	104.0	9.4	SMJ
495	8A-3-2	214.9	6384.4	42.4	16.0	11.8	111.8	4.3	37.2	165.4	30.8	ZA
496	8A-6-2	378.3	9350.5	46.8	17.1	5.0	102.0	192.2	17.7	171.7	7.1	IX
497	8A-6-2	556.7	7440.3	41.6	15.8	6.0	116.0	214.6	15.3	106.1	7.2	SMJ
498	8A-6-2	659.1	6539.4	47.1	15.3	10.4	141.6	172.0	23.0	109.8	8.1	EC
499	8A-6-2	604.9	7453.6	39.5	12.0	7.3	110.8	209.0	14.0	106.3	12.7	SMJ
500	8A-6-3	601.3	7233.9	48.3	12.0	11.5	111.0	235.5	13.4	110.7	9.2	SMJ
501	8A-7-5	605.9	6799.4	39.1	17.0	10.4	112.7	218.2	13.6	106.0	6.8	SMJ
502	8A-12-4	462.1	6934.9	31.6	9.5	6.7	105.2	209.4	15.8	105.2	8.2	SMJ
503	8A-12-4	531.9	6368.4	31.4	9.9	10.8	143.9	171.1	14.7	113.3	7.9	EC
504	8A-12-4	429.1	5701.0	34.2	10.9	4.9	98.5	194.8	13.8	100.7	7.4	SMJ
505	8A-7-1	482.9	8102.9	59.3	13.3	0.8	117.6	214.6	11.8	111.0	8.9	SMJ
506	8A-10-1	286.4	10391.7	50.6	10.8	25.2	143.6	35.9	34.9	195.9	21.1	ZA
507	8A-3-3	484.3	7034.9	64.8	12.3	8.1	107.7	216.0	13.3	112.1	7.8	SMJ
508	8A-3-3	635.5	8389.1	75.0	15.9	8.6	124.6	257.4	10.0	109.9	12.9	SMJ
509	8A-3-3	414.3	7911.5	36.0	12.9	5.9	109.8	230.2	17.2	111.5	7.9	SMJ
510	8A-3-3	531.3	6424.5	39.3	11.7	10.8	99.8	212.5	12.5	98.9	7.0	SMJ
511	8A-4-3	697.3	9639.6	37.0	14.0	9.7	130.0	248.3	15.3	96.9	8.2	UK
512	8A-5-4	445.4	7106.3	38.5	13.1	4.3	105.3	213.6	14.9	106.8	6.4	SMJ
513	8A-5-4	615.6	6679.0	33.6	13.7	3.8	99.5	211.8	15.7	103.4	8.3	SMJ
514	8A-12-1	593.3	7488.6	42.6	11.0	7.8	107.8	227.4	11.1	102.6	7.2	SMJ
515	8A-12-1	360.0	7208.5	53.5	9.4	0.1	102.8	227.0	13.9	108.9	6.3	SMJ
516	8A-12-1	875.0	6998.2	34.0	13.2	5.5	153.3	181.6	17.6	119.4	10.6	EC

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
517	8A-12-1	618.6	6076.2	67.9	14.8	8.4	130.7	162.2	16.4	106.1	9.1	EC
518	8A-12-1	387.9	7401.3	28.5	17.0	7.1	102.7	187.9	15.0	96.9	9.0	SMJ
519	8A-4-4	549.0	7561.6	54.4	16.2	2.6	115.6	218.9	17.4	102.9	7.3	SMJ
520	8A-4-4	642.5	7131.6	33.8	14.9	4.5	102.2	202.3	15.1	107.9	5.5	SMJ
521	8A-5-3	460.0	6581.8	26.5	8.0	7.1	96.6	205.0	14.9	103.1	7.8	SMJ
522	8A-7-3	525.8	9432.8	80.8	13.2	5.4	132.9	227.7	13.7	114.8	6.7	SMJ
523	8A-7-3	654.1	9131.3	71.8	7.4	7.8	125.9	249.4	19.5	111.3	8.5	SMJ
524	8A-7-3	687.9	7928.2	56.0	17.9	7.5	152.1	168.9	21.8	113.7	10.8	EC
525	8A-7-3	675.1	6264.1	41.0	13.3	10.8	147.7	168.8	15.3	111.9	11.8	EC
526	8A-7-3	474.5	8107.0	51.6	15.4	7.0	118.7	226.3	9.4	108.1	9.4	SMJ
527	8A-7-3	785.9	7342.4	81.6	18.1	6.2	148.2	177.3	17.6	109.1	8.7	EC
528	8A-7-3	637.3	8445.5	32.2	21.3	7.0	129.2	269.7	13.1	109.2	8.9	SMJ
529	8A-7-3	865.9	10000.0	174.6	14.8	6.4	127.0	247.5	16.2	110.2	9.8	SMJ
530	8A-7-3	541.8	6074.3	36.6	9.4	7.8	128.0	160.0	13.7	101.8	6.5	EC
531	8A-5-1	316.6	11329.2	40.3	13.1	21.5	140.8	34.9	31.3	250.2	18.6	ZA
532	8A-5-1	639.7	8558.2	38.0	16.9	10.1	123.5	229.3	16.0	112.2	9.5	SMJ
533	8A-5-1	283.4	7687.8	29.1	14.8	1.1	116.0	221.5	12.9	115.1	8.8	SMJ
534	8A-13-1	517.4	8560.6	60.0	14.5	9.8	111.5	228.7	14.3	106.2	9.4	SMJ
535	8A-14-2	550.4	5742.7	21.8	13.6	6.1	132.6	158.2	14.4	106.2	9.5	EC
536	8A-9-3	323.6	5956.0	43.6	12.6	6.2	127.9	157.5	13.4	102.2	7.5	EC
537	8A-9-3	681.5	7194.6	26.8	19.3	8.4	146.0	171.5	17.0	104.9	9.9	EC
538	8A-9-3	439.4	6646.8	38.8	10.2	2.9	105.9	214.1	16.5	105.2	6.3	SMJ
539	8A-9-3	603.8	8890.4	70.4	14.6	8.5	113.8	222.9	11.3	109.5	9.9	SMJ
540	8A-9-3	552.8	8058.1	57.6	10.2	7.0	115.2	230.2	12.9	118.2	7.9	SMJ
541	8A-5-2	896.4	8184.6	55.8	10.2	13.1	126.8	221.2	14.9	114.5	9.7	SMJ
542	8A-5-2	336.7	7173.9	17.6	10.7	-2.9	99.2	219.2	15.0	115.0	10.0	SMJ
543	8A-5-2	687.2	9002.6	30.6	16.5	4.6	122.8	238.1	16.4	113.9	7.2	SMJ
544	8A-5-2	850.8	8004.2	60.9	11.9	6.5	154.8	194.2	15.6	109.8	8.9	EC
545	8A-5-2	415.8	8051.1	34.1	15.2	4.3	110.9	236.2	16.8	110.7	8.7	SMJ
546	8A-5-2	431.7	7683.2	41.2	14.8	6.8	116.3	214.3	12.6	113.7	10.0	SMJ
547	8A-5-2	555.2	7075.0	37.3	15.0	7.5	103.1	226.6	16.1	110.6	9.6	SMJ
548	8A-5-2	681.6	6137.4	40.7	16.0	5.8	133.3	163.4	17.6	113.8	12.2	EC
549	8A-5-2	394.9	7089.1	35.7	13.5	5.6	92.1	204.0	12.6	100.1	7.6	SMJ
550	8A-5-2	565.6	7645.9	40.4	11.2	12.3	105.9	225.7	13.7	109.8	10.8	SMJ
551	8A-5-2	465.7	7610.7	40.0	10.1	6.0	116.6	230.7	12.8	102.9	9.0	SMJ
552	8A-5-2	544.8	7799.5	35.1	11.9	1.6	103.4	214.4	16.7	109.3	5.5	SMJ
553	8A-5-2	830.4	9562.5	53.8	15.0	10.1	120.8	245.7	13.0	119.8	6.0	SMJ
554	8A-5-2	569.0	8100.4	24.6	11.3	1.6	113.2	214.5	14.4	116.9	5.8	SMJ
555	8A-5-2	567.6	8090.2	34.8	11.9	5.1	119.9	219.5	11.3	104.5	8.2	SMJ
556	8A-5-2	645.7	7200.8	42.0	15.7	7.8	120.0	210.4	13.3	107.3	6.6	SMJ
557	8A-5-2	760.3	10833.5	42.5	15.2	14.8	147.9	251.2	11.5	112.2	10.8	SMJ
558	8A-5-2	356.9	7356.1	18.2	12.0	4.5	111.9	221.1	15.0	109.3	8.3	SMJ
559	8A-5-2	337.7	7498.6	31.5	13.6	6.2	105.0	218.0	12.4	103.0	7.1	SMJ
560	8A-5-2	567.0	8100.2	67.2	13.9	10.9	103.4	203.4	14.1	93.8	10.0	SMJ
561	11A-5-3	768.0	7237.3	29.2	19.1	3.9	110.5	238.6	13.9	104.5	8.2	SMJ
562	11A-5-3	523.1	6786.4	29.7	11.7	4.1	101.8	213.5	12.2	108.5	9.2	SMJ
563	11A-5-4	428.3	6676.3	38.6	10.8	5.3	100.9	214.7	17.8	110.0	5.6	SMJ
564	11A-5-4	573.3	7583.6	42.1	14.0	11.2	127.7	224.2	10.1	115.5	6.4	SMJ

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
565	11A-5-4	566.7	7797.9	48.7	13.7	4.8	107.6	228.4	17.4	116.9	5.7	SMJ
566	11A-5-4	596.0	8225.5	51.5	16.8	3.7	109.3	243.1	13.5	108.2	8.7	SMJ
567	11A-5-4	492.5	7143.5	30.3	10.6	2.9	101.8	207.1	16.4	112.2	6.3	SMJ
568	11A-5-4	376.0	7628.2	68.0	13.3	8.6	116.0	233.2	14.0	108.3	9.5	SMJ
569	11A-5-4	726.1	7464.8	44.4	13.5	4.0	109.4	217.3	10.2	104.1	10.4	SMJ
570	11A-5-4	546.7	8545.0	60.3	17.3	5.4	120.9	247.3	17.8	108.7	10.9	SMJ
571	11A-5-4	538.5	9406.5	48.3	18.7	9.1	130.3	238.6	13.5	110.6	5.4	SMJ
572	11A-5-4	458.6	7487.1	42.6	12.4	8.7	110.0	213.6	15.3	118.0	7.0	SMJ
573	11A-5-4	340.2	8117.5	31.1	8.6	8.2	111.8	209.1	14.4	103.2	4.3	SMJ
574	11A-5-4	502.8	6653.2	34.0	14.7	-2.3	100.5	208.1	17.6	109.5	6.3	SMJ
575	11A-5-2	431.1	7084.2	47.1	11.6	9.0	106.3	215.0	16.1	104.4	6.7	SMJ
576	11A-5-2	686.8	7060.9	32.8	14.4	3.8	115.1	226.6	13.6	112.2	7.0	SMJ
577	11A-5-2	540.7	8597.5	28.7	17.5	5.2	113.9	236.6	13.8	113.4	10.2	SMJ
578	11A-5-2	818.9	9928.1	50.5	9.9	14.9	122.0	254.8	16.5	120.6	9.0	SMJ
579	11A-5-2	358.7	6683.0	30.3	13.2	6.0	100.4	197.0	14.2	107.0	10.4	SMJ
580	11A-5-1	359.2	6407.4	40.5	18.2	7.6	105.3	198.2	11.2	96.5	6.5	SMJ
581	11A-5-1	356.3	7050.1	32.8	8.9	8.1	113.3	229.1	11.0	110.3	8.3	SMJ
582	11A-5-1	835.0	9972.9	39.8	15.3	9.4	126.0	269.8	10.6	113.0	9.8	SMJ
583	11A-5-1	351.0	8255.6	49.4	14.3	9.0	112.6	235.4	14.3	112.4	11.7	SMJ
584	11A-5-1	693.0	8031.4	35.9	17.5	8.2	113.9	219.9	12.2	108.1	8.5	SMJ
585	11A-4-4	396.7	7686.4	26.7	8.5	5.8	121.6	227.1	14.2	122.1	8.6	SMJ
586	11A-3-1	536.7	7684.8	52.9	16.7	8.5	122.8	242.1	16.1	115.6	9.4	SMJ
587	11A-3-1	604.4	6919.0	46.5	12.9	5.8	100.4	221.7	15.8	105.0	8.3	SMJ
588	11A-3-1	610.4	6852.7	32.6	16.8	8.5	104.7	219.3	11.7	113.9	9.5	SMJ
589	11A-3-1	695.7	6404.7	28.2	11.9	4.4	101.3	206.7	11.9	108.1	7.8	SMJ
590	11A-3-1	402.4	9824.6	60.6	17.9	11.7	127.8	250.9	14.7	117.9	6.3	SMJ
591	11A-5-6	499.1	7312.9	62.9	14.4	6.3	107.6	209.2	16.1	110.8	7.3	SMJ
592	11A-5-6	559.5	7378.6	65.5	13.2	7.5	114.6	238.0	17.7	112.4	8.2	SMJ
593	11A-5-6	487.0	7672.6	51.2	15.1	1.6	109.2	209.9	14.6	118.1	5.8	SMJ
594	11A-5-5	515.7	7236.4	79.8	14.3	8.9	113.2	223.6	14.0	105.6	8.6	SMJ
595	11A-5-5	414.7	6782.8	29.0	14.5	11.2	105.2	210.8	11.3	111.4	8.0	SMJ
596	11A-5-5	414.4	6635.2	51.4	11.1	8.7	97.1	204.6	13.5	115.4	7.9	SMJ
597	11A-5-5	547.4	8080.9	20.2	10.8	8.1	118.9	233.0	12.3	116.0	9.1	SMJ
598	11A-5-5	388.8	6672.3	33.7	11.8	7.1	102.5	216.7	13.8	107.9	8.1	SMJ
599	11A-5-5	687.7	8880.1	29.8	8.9	12.2	121.6	242.2	17.2	112.5	9.0	SMJ
600	11A-5-5	487.9	6801.5	30.6	8.8	7.3	100.4	226.9	12.3	108.4	8.4	SMJ
601	11A-2-1	479.4	7306.0	39.1	9.5	8.9	112.9	217.8	12.3	113.4	9.1	SMJ
602	11A-2-1	687.5	7192.2	56.0	10.9	8.9	107.3	225.6	16.4	117.4	7.4	SMJ
603	11A-2-1	494.7	6529.6	40.4	13.0	11.9	107.2	194.5	11.0	108.4	8.1	SMJ
604	11A-2-1	695.1	6393.9	26.5	12.4	9.2	136.2	153.6	19.7	111.1	10.4	EC
605	11A-1-2	403.5	6761.4	41.8	13.5	7.6	104.8	209.2	11.1	106.4	11.8	SMJ
606	11A-1-2	605.9	12316.9	59.2	11.2	7.3	110.2	209.2	22.7	163.1	10.1	IX
607	11A-1-2	632.5	6152.9	38.7	13.2	5.9	133.4	154.6	18.4	106.0	9.8	EC
608	8A-1-4	574.7	7161.5	57.1	10.4	9.3	141.3	177.9	20.3	113.8	7.5	EC
609	8A-1-4	703.2	7125.5	36.5	13.0	5.2	149.7	168.3	15.9	109.9	9.5	EC
610	7B-1-2	648.9	6315.6	29.5	15.2	10.2	138.3	159.6	15.7	104.0	9.6	EC
611	7B-1-2	805.1	6138.9	33.7	4.7	9.6	125.5	145.7	19.3	104.9	8.4	EC
612	7B-1-2	204.0	9453.8	29.8	12.4	2.7	95.5	178.5	17.6	161.9	8.0	IX

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
613	7B-1-2	546.0	7388.0	39.9	18.1	13.6	146.3	176.6	20.3	110.9	6.1	EC
614	7B-1-2	552.0	6721.3	36.5	11.7	6.4	138.2	181.2	14.8	117.2	9.8	EC
615	7B-1-2	221.0	10464.3	47.5	21.0	5.1	131.6	241.7	8.8	112.3	8.8	SMJ
616	7B-1-2	918.8	9993.9	112.4	13.7	5.7	114.6	214.8	13.8	107.4	7.7	SMJ
617	7B-1-2	555.4	6672.9	21.2	12.9	6.0	89.1	188.1	10.5	94.4	5.7	SMJ
618	7B-1-2	765.4	6746.0	60.9	16.7	13.3	145.6	158.9	14.9	105.2	11.8	EC
619	7B-1-2	529.4	7724.9	189.7	21.3	-1.1	102.7	206.9	13.0	103.2	5.4	SMJ
620	9A-1-3	948.9	7882.8	41.6	20.0	11.4	147.1	170.6	20.9	110.3	11.6	EC
621	9A-1-3	513.3	8362.5	54.6	15.9	10.0	111.0	226.2	12.4	108.7	8.9	SMJ
622	8A-1-2	526.2	8651.4	38.5	15.2	9.5	110.5	208.8	14.2	103.1	8.2	SMJ
623	8A-1-2	593.8	6828.7	39.4	9.1	2.5	102.4	220.6	9.7	104.6	7.1	SMJ
624	8A-1-2	780.0	8799.7	54.6	17.8	8.2	138.3	247.9	19.2	131.8	11.6	SMJ
625	8A-1-2	862.1	9093.5	57.3	21.1	6.9	111.7	240.6	17.7	114.6	9.3	SMJ
626	7A-1-4	1011.1	6720.0	46.0	13.3	6.4	141.0	173.1	16.3	112.6	8.4	EC
627	6C-1-2	550.9	9555.3	75.8	16.8	7.2	115.5	245.1	12.6	108.1	5.5	SMJ
628	11B-1-2	535.5	8218.0	81.9	16.1	6.6	119.3	231.0	16.4	114.3	6.9	SMJ
629	11B-1-2	532.5	7934.7	53.5	9.4	2.5	122.4	223.6	14.3	113.8	9.2	SMJ
630	12C-1-3	625.9	7316.4	32.2	14.3	1.1	114.3	240.5	13.0	109.7	9.9	SMJ
631	12C-1-3	589.4	8794.2	68.5	18.7	6.6	116.5	233.5	7.8	110.4	5.4	SMJ
632	12C-1-3	717.2	7487.2	50.2	15.1	11.0	111.8	206.7	13.6	106.0	6.6	SMJ
633	6E-1-4	492.1	6838.2	41.5	13.7	1.6	105.5	191.4	12.3	101.2	7.2	SMJ
634	6E-1-4	596.3	7310.1	23.8	16.8	11.9	154.9	170.5	19.2	120.2	10.4	EC
635	6E-1-4	569.6	6505.2	47.7	12.9	12.2	97.1	197.9	16.1	109.1	8.4	SMJ
636	6E-1-4	472.4	12766.0	65.7	16.0	10.1	120.6	251.0	15.4	114.4	11.7	SMJ
637	6E-1-4	983.0	10424.8	39.0	11.4	7.9	131.7	249.3	17.3	113.4	11.9	SMJ
638	7B-1-6	223.1	6277.5	62.8	15.1	6.8	91.0	185.9	14.0	101.6	8.7	SMJ
639	7B-1-6	480.0	7219.0	32.5	15.6	3.4	101.5	238.1	10.7	112.1	9.8	SMJ
640	12C-1-2	622.9	6331.7	31.0	13.1	5.3	116.0	218.3	10.8	105.2	10.1	SMJ
641	12C-1-2	456.6	8512.6	44.4	9.9	7.1	94.8	196.5	10.5	106.0	8.8	SMJ
642	12C-1-2	621.3	10320.3	56.1	15.2	8.1	149.7	168.8	19.3	111.6	11.4	EC
643	12A-1-1	377.8	7845.8	14.5	11.6	0.1	112.2	216.6	11.6	101.0	7.0	SMJ
644	12A-1-1	727.4	9626.9	39.7	14.1	6.7	104.9	252.9	17.2	115.5	11.8	SMJ
645	12A-1-1	433.0	9423.3	33.2	17.8	3.7	106.4	198.4	11.5	110.7	10.9	SMJ
646	12A-1-1	473.5	9620.7	57.8	11.2	8.5	105.0	217.9	14.5	112.4	6.9	SMJ
647	6E-1-3	329.0	6331.0	55.5	15.7	5.7	123.8	162.4	18.3	105.1	11.6	EC
648	6E-1-3	852.0	7520.2	41.1	20.8	12.5	152.1	184.8	21.8	115.5	9.9	EC
649	6E-1-3	773.1	8555.3	48.6	13.7	10.8	153.9	198.7	20.6	111.6	8.2	EC
650	6E-1-3	864.4	7000.9	23.5	13.9	13.4	148.5	170.1	18.7	110.8	8.5	EC
651	6E-1-3	733.5	9578.9	57.6	13.1	15.3	151.4	176.3	18.5	111.9	10.5	EC
652	6E-1-3	323.3	8746.5	46.2	9.8	8.3	119.2	244.5	13.0	109.9	7.9	SMJ
653	6E-1-3	448.1	8627.4	50.4	14.3	4.5	118.6	219.9	12.0	108.1	7.6	SMJ
654	6E-1-3	388.3	7488.1	40.2	9.2	5.9	105.0	220.6	11.3	100.9	7.0	SMJ
655	6E-1-3	454.1	6891.3	52.4	15.6	3.4	104.7	213.8	10.5	105.8	8.1	SMJ
656	6E-1-3	229.0	8229.0	40.3	13.8	0.2	95.8	191.8	15.4	106.3	8.7	SMJ
657	6E-1-3	233.7	9083.3	30.6	10.8	5.9	100.5	210.3	15.4	100.4	4.9	SMJ
658	10A-1-3	674.2	7509.4	58.0	17.6	9.6	122.4	236.0	13.7	115.0	5.5	SMJ
659	7A-1-2	617.3	8386.7	162.0	24.4	5.7	138.8	234.3	15.7	117.2	12.2	SMJ
660	7A-1-2	641.6	6462.6	41.7	10.2	10.4	145.2	168.9	16.9	113.7	11.1	EC

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
661	7A-1-2	458.7	7467.2	42.7	8.9	6.6	115.0	225.4	17.3	113.1	8.4	SMJ
662	7A-1-2	609.5	7458.4	45.0	15.2	7.4	109.2	222.5	11.7	112.0	9.3	SMJ
663	7A-1-2	618.8	9050.1	60.2	13.9	7.9	145.7	188.7	21.6	106.0	10.8	EC
664	7A-1-2	298.4	8157.5	40.0	12.3	10.1	110.7	223.0	12.1	108.9	8.4	SMJ
665	7A-1-2	549.8	6844.4	50.5	10.6	10.5	140.9	149.4	10.0	103.5	10.5	EC
666	7A-1-2	299.6	11166.5	24.8	13.8	4.8	114.7	224.1	15.2	108.4	8.6	SMJ
667	6E-1-1	674.6	6155.4	49.0	13.0	11.5	137.1	167.9	16.7	107.4	10.7	EC
668	6E-1-1	723.8	6987.8	51.6	9.3	8.8	133.3	156.7	13.7	106.0	12.1	EC
669	6E-1-1	539.1	5989.6	24.0	12.2	6.1	128.1	145.7	16.4	108.3	9.3	EC
670	6E-1-1	1106.8	14308.7	57.1	15.0	3.6	97.2	188.7	22.1	169.6	5.5	IX
671	6B-1-1	431.9	6495.0	33.2	9.1	4.5	143.8	156.7	14.6	104.7	9.9	EC
672	6B-1-1	500.0	10048.9	39.8	8.9	4.6	100.4	173.1	11.4	145.5	8.0	IX
673	6A-4-3	564.6	6899.6	42.5	11.6	1.4	106.5	216.5	15.0	119.7	7.5	SMJ
674	6A-4-3	328.7	8219.0	75.9	16.1	-0.6	111.5	232.1	16.0	107.3	8.4	SMJ
675	6A-4-3	842.4	7627.4	53.8	15.1	2.9	121.8	230.1	18.2	118.5	5.8	SMJ
676	11B-1-10	488.1	6108.0	48.2	12.2	6.3	126.6	159.3	19.5	103.4	7.2	EC
677	11B-1-10	674.1	6843.2	37.0	12.8	11.1	139.9	165.0	21.6	118.6	9.9	EC
678	11B-1-10	336.1	7007.9	34.2	14.2	7.1	106.7	203.5	14.5	108.9	8.1	SMJ
679	11B-1-10	721.3	7059.0	37.9	18.0	7.1	99.2	218.2	12.4	105.6	6.4	SMJ
680	11B-1-10	324.9	7238.5	29.8	14.8	5.2	111.1	208.5	13.2	105.8	7.3	SMJ
681	11B-1-10	324.8	7395.8	28.6	15.2	3.5	110.2	219.9	11.2	110.0	10.2	SMJ
682	11B-1-10	383.1	7502.6	48.5	14.6	6.4	108.8	206.8	11.4	109.5	6.0	SMJ
683	11B-1-10	409.7	7211.8	35.2	12.2	6.4	104.0	219.4	9.6	95.8	9.7	SMJ
684	11B-1-10	858.9	9714.9	84.3	18.9	10.3	171.6	205.0	22.4	125.2	11.4	EC
685	11B-1-10	401.0	7616.0	32.7	12.9	6.5	108.4	219.0	18.3	117.5	7.1	SMJ
686	11B-1-10	434.3	6241.3	41.6	11.9	7.7	139.0	164.6	17.0	111.2	10.0	EC
687	11B-1-10	530.7	8150.2	59.5	11.9	9.8	118.5	207.9	12.9	107.3	9.2	SMJ
688	11B-1-10	431.4	7994.9	52.2	11.4	10.8	113.0	220.1	13.7	111.1	5.2	SMJ
689	11B-1-10	427.1	6430.3	16.3	9.1	4.5	102.5	211.4	12.7	104.7	6.8	SMJ
690	11B-1-10	507.1	7201.4	33.7	13.7	5.7	108.1	205.9	14.5	104.7	5.3	SMJ
691	11B-1-10	390.9	6953.7	35.3	14.5	6.9	100.9	208.5	12.1	102.7	7.0	SMJ
692	11B-1-10	465.9	7280.0	32.5	12.9	2.6	109.5	206.8	7.1	109.6	8.3	SMJ
693	11B-1-10	675.6	7364.7	55.8	15.8	7.5	101.2	216.8	19.7	109.3	6.7	SMJ
694	11B-1-10	364.6	8164.2	44.8	16.0	3.9	109.1	207.1	8.8	103.9	8.0	SMJ
695	11B-1-10	484.1	7306.1	31.5	11.3	8.0	109.1	216.4	13.9	106.2	7.5	SMJ
696	11B-1-10	448.0	7978.4	59.7	9.9	9.2	106.4	215.8	13.7	96.8	6.4	SMJ
697	11B-1-10	458.7	8231.9	48.1	15.4	4.1	115.1	221.1	17.1	115.4	7.4	SMJ
698	6A-6-9	324.4	8163.2	32.4	16.6	3.9	119.2	239.0	15.8	122.3	8.7	SMJ
699	6A-6-9	638.7	6691.4	54.1	15.3	12.7	111.7	212.3	13.8	108.5	7.0	SMJ
700	6A-6-9	464.1	8490.8	28.2	9.9	4.9	128.2	256.6	9.4	107.9	9.4	SMJ
701	6A-6-9	565.3	8255.1	47.0	10.2	8.4	134.4	227.3	13.0	113.3	10.3	SMJ
702	6A-5-3	515.8	6187.6	43.8	15.0	4.8	129.3	153.2	18.5	107.2	11.0	EC
703	12C-1-1	622.1	7161.2	37.0	13.9	8.3	138.8	187.9	19.8	105.2	9.9	EC
704	12C-1-1	498.8	7823.4	62.0	8.5	9.9	114.3	221.0	15.1	112.7	6.8	SMJ
705	12C-1-1	580.2	7432.9	51.2	19.5	-0.1	117.8	221.9	10.5	100.8	10.9	SMJ
706	12C-1-1	508.6	7743.0	59.7	7.7	8.8	118.8	236.3	16.0	118.0	7.7	SMJ
707	12C-1-1	748.0	6793.2	55.1	17.7	7.3	104.8	206.8	13.0	103.3	9.2	SMJ
708	12C-1-1	281.1	7320.7	36.9	12.5	4.9	106.4	215.2	17.7	102.3	7.3	SMJ

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
709	12C-1-1	714.9	7497.6	51.5	15.4	5.6	117.9	201.8	12.7	101.1	8.7	SMJ
710	12C-1-1	743.3	7339.1	40.0	20.0	6.6	147.5	184.6	18.2	107.6	9.8	EC
711	12C-1-1	708.5	7652.7	40.4	13.5	14.8	119.6	230.1	14.8	117.6	10.3	SMJ
712	12C-1-1	675.4	7154.7	36.3	18.0	12.3	118.1	224.8	18.9	127.0	10.0	SMJ
713	12C-1-1	857.7	7053.0	46.0	14.1	11.1	134.1	173.9	17.0	117.7	11.5	EC
714	12C-1-1	767.4	6604.5	46.9	19.7	7.7	119.0	222.4	15.2	114.2	8.2	SMJ
715	12C-1-1	605.8	7269.0	44.3	15.2	5.6	116.4	216.6	16.0	114.1	11.1	SMJ
716	12C-1-1	668.6	8129.0	53.0	17.0	5.3	122.0	252.8	14.8	120.2	7.6	SMJ
717	12C-1-1	806.9	7753.9	28.7	16.0	13.3	120.0	232.9	16.3	120.7	9.4	SMJ
718	12C-1-1	562.6	7916.7	33.4	16.7	9.7	125.3	244.2	15.3	124.4	9.8	SMJ
719	12C-1-1	799.1	8538.2	52.5	17.4	11.2	129.4	236.2	13.7	112.5	10.0	SMJ
720	12C-1-1	725.6	7004.9	53.9	15.9	8.6	112.8	225.9	15.3	124.8	8.0	SMJ
721	12C-1-1	787.5	8060.6	46.9	16.0	10.7	120.5	220.1	18.8	105.0	11.4	SMJ
722	8A-1-3	895.9	7257.7	46.9	16.8	15.1	149.6	186.3	24.2	123.7	13.0	EC
723	6A-5-2	1050.9	9895.5	66.6	18.8	9.5	160.2	286.3	15.3	128.1	10.7	SMJ
724	6A-5-2	687.5	5852.7	59.9	15.8	8.9	143.8	161.9	20.7	111.1	7.0	EC
725	6A-5-2	898.3	8752.5	68.5	12.3	10.0	116.7	239.5	18.2	113.5	11.9	SMJ
726	6C-1-4	613.1	6926.8	40.4	15.8	8.0	113.8	220.0	15.1	114.6	9.8	SMJ
727	6C-1-4	931.5	7487.2	54.3	15.0	8.9	126.9	247.9	13.9	121.3	8.8	SMJ
728	6C-1-4	745.6	7170.8	48.4	15.5	10.1	117.1	240.5	18.3	123.1	10.9	SMJ
729	6C-1-4	1099.3	11526.6	84.4	17.7	17.9	157.5	283.4	12.8	121.4	11.8	SMJ
730	6A-3-2	924.6	6195.2	31.8	20.3	10.3	143.5	173.0	20.5	123.6	12.5	EC
731	6B-2-1	980.8	6746.0	69.0	17.0	10.5	163.0	188.7	21.1	111.8	8.8	EC
732	6B-2-1	1076.1	7053.2	34.4	16.8	6.2	154.7	193.1	19.6	116.8	10.7	EC
733	6B-2-1	792.8	6855.5	39.0	17.3	15.8	114.0	223.7	16.1	109.4	9.3	SMJ
734	6B-2-1	647.0	8220.0	51.8	13.1	6.8	120.0	250.3	14.1	124.5	7.7	SMJ
735	6B-2-1	917.5	6775.5	37.7	18.7	3.4	124.4	213.5	17.8	90.0	8.9	SMJ
736	6B-2-1	663.7	7175.3	49.3	19.5	8.2	121.5	215.5	15.3	117.9	7.5	SMJ
737	7B-1-3	915.4	6535.0	50.7	12.0	7.9	154.0	165.3	21.6	121.7	12.2	EC
738	7B-1-3	987.8	7456.7	69.5	23.9	11.0	158.9	189.7	17.7	119.4	12.1	EC
739	7B-1-3	1013.2	10130.9	56.2	19.7	7.9	140.9	272.2	17.6	123.5	8.3	SMJ
740	7B-1-3	733.7	7815.2	42.2	16.3	12.0	115.1	237.8	21.3	119.2	9.9	SMJ
741	7B-1-3	999.8	8098.1	58.7	14.7	12.8	107.5	239.3	17.9	121.4	9.9	SMJ
742	7B-1-3	963.9	9978.4	59.9	14.6	14.7	144.9	293.7	18.2	130.9	11.5	SMJ
743	7B-1-3	734.8	8511.1	69.1	20.4	14.5	117.8	240.2	17.8	129.4	7.0	SMJ
744	7B-1-3	628.3	6785.2	38.6	16.1	15.8	137.4	175.7	17.1	120.5	15.3	EC
745	7B-1-3	795.7	6678.0	49.1	14.0	10.8	97.7	225.3	18.9	116.2	8.8	SMJ
746	7B-1-3	562.0	7058.4	50.7	17.7	7.7	104.4	238.5	15.5	120.9	9.2	SMJ
747	13A-1-2	1241.3	9220.0	64.2	21.1	14.8	176.6	203.1	20.6	127.8	10.9	EC
748	13A-1-2	878.4	7109.3	58.9	17.9	11.2	162.1	179.0	19.1	109.3	10.4	EC
749	13A-1-2	800.8	7253.2	49.9	16.7	8.9	167.7	165.8	21.3	118.7	10.9	EC
750	13A-1-2	776.2	8705.6	42.1	19.3	14.7	129.4	254.4	17.9	125.1	10.3	SMJ
751	13A-1-2	1200.7	9207.7	51.3	20.0	21.4	187.4	202.7	26.4	123.6	5.8	EC
752	13A-1-2	974.2	8453.9	56.9	16.4	12.2	172.5	200.8	23.1	123.7	12.2	EC
753	13A-1-2	1343.9	8007.7	66.3	17.6	9.4	167.6	197.8	16.9	125.7	7.9	EC
754	13A-1-2	892.0	8425.4	69.5	18.5	11.9	142.9	191.9	21.3	112.6	7.8	EC
755	11B-1-9	707.2	9096.9	64.6	16.7	11.0	124.9	244.2	17.0	128.0	10.1	SMJ
756	11B-1-9	967.7	8872.4	49.1	16.4	14.0	125.4	256.2	14.1	121.7	9.6	SMJ

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
757	11B-1-9	903.3	7825.3	55.9	13.3	12.0	127.6	247.4	14.8	126.5	10.7	SMJ
758	11B-1-9	641.2	6830.1	50.5	15.8	8.7	111.8	228.3	17.4	119.7	7.9	SMJ
759	11B-1-5	780.6	7883.9	64.6	19.6	8.7	120.7	251.8	16.2	128.0	10.4	SMJ
760	11B-1-6	746.1	7552.0	58.9	19.4	11.4	132.3	259.2	14.6	124.6	12.4	SMJ
761	6A-6-2	742.7	8638.5	57.0	16.0	12.7	126.7	243.4	17.4	119.4	8.1	SMJ
762	6A-3-5	808.1	7691.5	43.3	19.2	9.6	123.0	261.2	18.0	130.9	11.7	SMJ
763	10A-1-1	946.1	8924.4	78.8	17.8	14.7	162.3	192.4	23.4	131.4	11.9	EC
764	10A-1-1	890.9	8174.4	60.2	8.7	8.2	156.9	193.3	19.7	113.3	6.4	EC
765	10A-1-1	622.0	7472.6	40.3	11.3	4.2	115.2	242.3	14.3	107.6	10.4	SMJ
766	10A-1-1	474.9	9287.1	57.1	17.0	9.0	123.4	231.7	14.9	112.6	4.5	SMJ
767	10A-1-1	775.2	10014.7	53.5	16.5	9.1	128.4	254.7	15.4	119.5	10.3	SMJ
768	11B-1-12	775.2	10014.7	53.5	16.5	9.1	128.4	254.7	15.4	119.5	10.3	SMJ
769	11B-1-12	555.1	7560.0	48.1	14.5	7.2	114.7	211.0	15.7	117.9	10.6	SMJ
770	11B-1-12	815.8	9209.4	50.3	12.8	5.8	135.5	272.2	10.8	124.2	12.4	SMJ
771	11B-1-12	703.5	7813.0	43.0	12.3	12.0	126.0	234.5	14.6	122.4	9.3	SMJ
772	11B-1-12	497.9	7724.6	50.5	12.9	12.9	118.8	239.2	19.0	118.0	5.9	SMJ
773	11B-1-8	1027.1	7734.4	60.6	14.3	11.7	120.0	237.3	15.8	129.5	10.9	SMJ
774	6A-6-6	726.9	7731.9	67.3	16.6	9.6	119.3	244.4	19.3	130.5	9.1	SMJ
775	6A-6-6	885.9	7187.0	68.3	14.0	14.6	120.8	240.4	14.5	122.8	11.3	SMJ
776	6A-4-5	1009.6	8710.5	58.1	14.2	9.7	143.9	264.4	21.2	129.5	9.7	SMJ
777	6A-3-7	900.9	8343.3	58.6	18.7	14.3	130.1	254.1	19.3	121.2	6.4	SMJ
778	13A-1-1	851.8	7284.8	70.3	21.0	13.6	179.8	201.9	21.9	129.3	7.6	EC
779	13A-1-1	1378.9	9888.0	79.5	21.0	15.4	191.6	231.6	20.1	124.9	14.7	EC
780	13A-1-1	957.4	7771.9	61.2	16.5	11.6	178.1	193.9	22.4	123.2	12.0	EC
781	13A-1-1	1345.3	9095.9	66.5	22.1	12.7	185.7	205.5	20.7	122.3	11.6	EC
782	13A-1-1	912.6	7316.7	64.0	15.6	17.9	166.2	193.6	17.6	122.0	12.0	EC
783	13A-1-1	1264.4	9591.5	69.0	20.8	17.7	186.6	210.3	14.1	121.2	14.0	EC
784	13A-1-1	1162.2	8684.0	72.2	19.5	8.9	179.2	197.6	26.5	116.0	9.3	EC
785	13A-1-1	1040.2	8041.5	74.0	20.9	13.5	168.8	196.6	23.4	120.5	9.4	EC
786	13A-1-1	972.7	8748.9	75.1	19.9	16.1	176.2	208.4	22.4	136.0	8.8	EC
787	13A-1-1	1367.6	9020.4	71.4	18.6	15.7	170.4	192.9	22.7	125.7	10.2	EC
788	13A-1-1	1136.5	8420.3	62.7	18.0	18.6	177.9	189.9	20.5	126.2	12.2	EC
789	13A-1-1	708.9	6908.2	57.9	24.8	6.9	149.6	178.7	19.5	111.9	11.2	EC
790	13A-1-1	1018.0	9137.9	56.1	19.4	11.9	125.0	266.7	18.1	122.2	10.7	SMJ
791	7A-1-1	865.1	11265.3	83.6	22.7	11.7	142.1	280.3	17.6	124.7	11.5	SMJ
792	11B-1-2	1024.6	9227.1	60.1	17.0	13.4	139.2	270.0	17.3	136.1	6.0	SMJ
793	11B-1-2	941.4	10317.8	76.1	15.3	8.8	140.6	260.7	16.8	130.0	10.1	SMJ
794	11B-1-2	795.2	6774.5	58.3	17.5	11.4	115.3	227.8	13.2	110.2	8.9	SMJ
795	6C-1-1	833.8	6859.7	50.3	11.9	15.7	166.5	186.6	27.0	123.1	8.7	EC
796	6C-1-1	896.1	7346.5	46.2	15.0	13.1	163.7	179.9	20.6	123.8	13.1	EC
797	6C-1-1	957.2	9000.6	72.4	13.6	13.7	116.5	241.0	18.5	112.7	8.5	SMJ
798	6E-1-2	942.5	9348.4	43.4	17.3	13.8	143.4	258.7	16.3	130.2	9.0	SMJ
799	6E-1-2	1306.1	9257.3	68.7	24.4	8.1	121.6	258.5	21.4	124.4	12.9	SMJ
800	6E-1-2	1002.7	8689.9	61.4	19.3	12.6	171.4	201.5	20.5	119.2	11.6	EC
801	6E-1-2	985.1	9037.7	60.2	19.8	12.2	130.4	263.0	15.8	125.0	11.5	SMJ
802	6E-1-2	1065.6	8776.1	49.6	22.5	14.5	174.8	196.1	20.9	130.0	9.6	EC
803	6E-1-2	768.1	7089.0	59.2	18.8	14.3	150.1	197.9	24.5	125.7	12.4	EC
804	6E-1-2	1137.0	7347.1	62.9	18.8	12.5	147.4	179.6	20.4	114.0	7.9	EC

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
805	6E-1-2	796.0	8555.1	33.1	14.5	9.5	167.0	165.8	19.2	120.5	10.7	EC
806	6E-1-2	610.5	7578.8	31.6	16.0	6.7	115.5	223.3	17.5	111.3	7.5	SMJ
807	6E-1-2	851.4	7747.5	52.6	20.0	7.3	123.1	243.6	18.2	120.3	5.3	SMJ
808	6E-1-2	804.5	7615.3	44.8	18.0	9.1	118.0	232.9	16.5	116.2	12.2	SMJ
809	6E-1-2	1281.8	7909.6	79.7	21.1	12.9	118.0	238.6	14.3	110.7	7.5	SMJ
810	6E-1-2	907.0	7315.1	77.0	16.5	10.5	109.4	218.7	13.5	117.4	9.7	SMJ
811	6E-1-2	719.9	7543.3	34.3	17.5	10.0	116.0	228.1	15.8	118.5	7.1	SMJ
812	6E-1-2	737.2	7747.4	55.8	16.9	7.6	112.0	222.8	15.2	111.3	8.9	SMJ
813	12B-1-2	763.8	7896.0	62.9	20.5	6.4	125.6	248.2	11.1	116.3	11.6	SMJ
814	12B-1-2	928.7	7827.7	68.6	19.0	10.3	135.1	258.6	19.0	119.2	7.5	SMJ
815	12B-1-2	998.8	7971.6	59.3	16.3	7.5	126.7	262.1	21.0	133.2	10.1	SMJ
816	12B-1-2	756.8	7183.0	73.4	13.9	8.2	109.0	218.3	17.6	113.2	10.9	SMJ
817	12B-1-2	1027.5	8082.5	49.4	12.0	16.0	137.5	248.1	17.6	124.3	9.8	SMJ
818	12B-1-2	976.7	8804.5	51.1	16.1	12.7	133.8	260.6	15.8	126.2	9.0	SMJ
819	6A-4-2	663.1	7845.3	57.9	18.8	12.8	119.6	253.6	18.9	124.0	11.0	SMJ
820	6A-4-2	1000.9	6609.9	30.3	18.4	8.7	108.2	235.4	20.8	125.1	10.3	SMJ
821	6A-4-2	1046.0	9791.1	72.1	23.3	10.5	123.4	241.5	14.7	113.1	9.1	SMJ
822	6A-4-2	1026.8	8021.5	56.2	18.0	10.7	129.9	246.4	16.5	121.3	7.3	SMJ
823	7B-1-4	945.2	7382.7	67.8	12.7	15.2	164.4	184.6	19.3	116.7	9.1	EC
824	7B-1-4	899.5	8707.7	69.9	20.2	7.5	129.6	246.3	15.7	122.9	7.1	SMJ
825	7B-1-4	716.6	7981.2	43.5	13.2	10.5	125.8	249.0	20.3	123.5	9.3	SMJ
826	7B-1-4	886.8	10413.3	74.1	20.0	7.3	148.5	273.1	16.7	131.6	8.4	SMJ
827	6A-6-1	867.7	7007.3	58.5	23.5	11.6	157.0	189.8	20.5	123.9	10.7	EC
828	9A-1-4	1004.3	9920.5	71.9	16.5	13.0	108.4	240.0	13.3	112.0	10.3	SMJ
829	8A-1-1	773.7	8575.7	72.1	15.1	14.4	126.9	270.0	19.9	123.7	7.7	SMJ
830	6C-1-11	523.7	6591.2	45.2	16.3	16.5	118.6	215.0	17.1	108.3	8.8	SMJ
831	11A-1-3	980.0	9070.8	59.2	14.8	10.5	145.8	267.5	18.8	119.8	8.4	SMJ
832	6A-6-4	735.5	6543.1	50.5	17.5	9.8	106.3	208.1	16.3	118.0	8.1	SMJ
833	6A-6-4	863.9	7472.1	47.9	12.7	10.9	119.1	245.3	19.4	126.2	9.1	SMJ
834	6A-5-1	1176.8	9183.2	42.5	13.5	7.2	121.5	242.6	21.6	121.9	6.1	SMJ
835	6A-5-1	619.5	7606.8	46.8	17.4	13.2	125.6	220.3	16.0	119.3	9.7	SMJ
836	6A-5-1	780.2	7672.0	31.5	9.6	9.0	129.2	245.5	11.5	117.8	5.5	SMJ
837	9A-1-6	761.5	9187.4	67.5	21.6	10.8	132.5	238.9	18.0	125.7	7.8	SMJ
838	9A-1-6	671.0	7633.6	50.1	12.0	6.3	122.9	214.7	14.0	122.3	7.6	SMJ
839	11A-1-1	786.5	7858.3	57.1	17.5	15.5	122.5	231.1	14.8	128.3	9.7	SMJ
840	11A-1-1	681.7	8125.1	57.2	16.9	7.5	120.3	234.8	15.8	121.6	10.6	SMJ
841	12B-1-1	737.4	7316.9	58.7	17.3	9.1	111.8	209.5	18.2	117.4	9.0	SMJ
842	6C-1-3	791.6	7526.8	59.7	12.0	10.8	125.9	221.8	19.2	125.4	8.9	SMJ
843	6C-1-3	768.9	7296.1	54.2	15.0	10.6	120.2	246.7	14.9	113.1	7.9	SMJ
844	6C-1-3	750.0	8459.4	50.5	13.3	10.7	126.0	247.5	15.5	127.9	8.7	SMJ
845	6C-1-3	1098.7	7106.1	53.2	10.6	9.2	161.9	180.5	22.0	125.9	10.5	EC
846	6C-1-3	797.2	7185.4	51.4	17.9	8.8	147.2	165.1	21.1	122.4	10.7	EC
847	6C-1-3	819.0	8805.2	59.2	14.3	14.2	118.0	256.1	17.6	127.0	7.6	SMJ
848	6C-1-3	828.9	8915.2	63.1	17.3	16.5	167.0	182.5	19.3	122.9	9.4	EC
849	6C-1-3	718.4	7782.2	52.6	15.0	12.2	118.0	237.0	21.6	128.0	8.6	SMJ
850	6C-1-3	919.4	7875.7	58.8	18.1	10.6	114.9	260.3	13.4	115.8	9.7	SMJ
851	6C-1-3	669.2	9503.9	61.2	18.1	9.5	124.2	239.7	16.5	125.0	10.4	SMJ
852	6C-1-3	1103.3	7035.5	42.6	18.8	9.5	165.1	185.5	18.9	123.6	10.5	EC

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
853	6C-1-3	806.0	8722.8	44.2	15.7	10.3	135.2	256.5	16.1	135.5	9.8	SMJ
854	6C-1-3	897.0	8834.5	50.5	20.3	9.5	118.5	242.7	10.6	114.4	10.8	SMJ
855	6C-1-3	924.6	6956.5	48.5	14.4	13.3	153.4	171.6	22.4	120.1	10.9	EC
856	6C-1-3	1107.8	9661.8	67.7	23.0	14.8	173.1	198.7	23.5	133.4	13.3	EC
857	6C-1-3	879.4	6803.6	41.1	13.6	14.4	153.7	184.3	22.5	118.2	14.8	EC
858	6C-1-3	590.8	10823.0	27.2	15.1	2.2	112.0	189.4	15.6	171.1	9.9	IX
859	6C-1-3	867.0	8009.4	55.1	20.5	12.6	113.1	229.2	17.9	121.7	7.7	SMJ
860	6C-1-3	801.2	8085.7	37.2	17.3	5.2	119.6	247.3	10.9	117.4	8.9	SMJ
861	6C-1-3	619.1	8347.1	64.4	20.0	4.7	118.0	238.5	17.7	123.3	10.4	SMJ
862	6C-1-3	756.4	8083.3	73.7	13.1	2.5	144.2	239.8	13.2	122.4	9.6	SMJ
863	10A-1-2	736.0	7723.7	42.9	17.3	11.8	127.4	235.1	14.9	113.3	8.0	SMJ
864	10A-1-2	727.5	7561.2	59.9	14.6	18.5	169.3	195.4	21.2	128.8	13.5	EC
865	10A-1-2	710.6	8830.6	69.2	15.0	9.8	120.5	234.9	12.2	110.5	9.8	SMJ
866	10A-1-2	807.1	9370.5	67.3	13.1	10.9	129.8	226.1	15.6	118.0	10.7	SMJ
867	10A-1-2	793.4	7378.1	42.1	14.2	5.0	114.1	226.0	18.4	125.5	9.4	SMJ
868	10A-1-2	852.3	6493.6	35.6	12.8	11.5	152.2	166.9	20.4	112.9	11.9	EC
869	10A-1-2	528.5	6793.6	34.9	9.8	15.4	105.3	230.8	16.6	118.5	10.8	SMJ
870	10A-1-2	905.9	8646.9	62.3	14.7	17.6	147.2	181.9	21.5	115.5	12.2	EC
871	6C-1-6	797.3	7443.1	55.6	23.0	7.9	118.6	234.2	15.6	122.8	10.0	SMJ
872	6C-1-6	874.7	6635.5	49.7	22.6	9.0	114.3	231.7	14.6	124.0	10.3	SMJ
873	6C-1-6	470.9	6978.5	64.8	15.8	7.0	117.4	223.0	15.9	114.8	7.7	SMJ
874	6C-1-6	792.3	6959.1	39.7	21.4	10.2	121.7	239.1	12.8	123.1	9.7	SMJ
875	7A-1-3	680.7	7934.9	52.6	14.5	10.4	116.5	244.6	15.9	124.5	10.7	SMJ
876	7A-1-3	1236.9	10921.4	92.3	28.0	10.9	171.9	201.5	16.1	118.9	10.2	EC
877	7A-1-3	657.6	6727.5	56.1	19.3	9.5	97.8	207.0	10.6	107.5	11.9	SMJ
878	6A-8-6	664.5	6629.4	39.4	14.2	5.9	109.2	232.5	15.6	120.1	9.1	SMJ
879	6A-8-6	580.1	7573.7	36.8	13.5	6.9	122.2	251.7	17.2	115.6	10.8	SMJ
880	6A-8-6	712.7	7664.8	37.1	15.9	9.7	126.4	238.2	17.9	116.3	9.4	SMJ
881	6C-1-5	917.4	6561.7	52.2	17.1	13.5	151.3	176.8	21.7	118.3	10.9	EC
882	6C-1-5	840.3	7389.3	79.9	16.1	12.2	114.4	235.7	18.6	122.3	8.8	SMJ
883	6C-1-5	714.6	6768.1	65.9	17.3	16.3	164.2	175.8	26.2	125.1	10.3	EC
884	6C-1-5	986.2	8643.9	44.6	13.9	3.9	146.3	271.3	18.0	125.9	9.5	SMJ
885	6C-1-5	839.4	6570.7	67.3	19.7	9.6	150.4	178.3	19.0	114.6	9.1	EC
886	6C-1-5	947.6	7717.2	53.6	12.5	12.8	127.0	235.2	12.9	116.7	6.7	SMJ
887	6C-1-5	689.1	7812.8	44.1	16.1	15.4	125.0	230.4	14.4	112.3	10.8	SMJ
888	6C-1-5	641.7	7549.1	57.7	16.9	9.0	131.5	239.9	16.9	117.5	13.1	SMJ
889	6C-1-5	926.7	7538.3	55.9	20.2	13.8	121.9	247.5	15.0	130.6	10.8	SMJ
890	6C-1-5	721.0	7121.4	57.4	15.6	11.5	118.5	238.1	15.6	124.2	8.7	SMJ
891	1A-1-1	912.6	8714.7	60.2	15.8	14.5	136.2	279.6	19.0	132.4	10.4	SMJ
892	1A-1-1	840.9	7048.9	59.0	12.6	12.4	118.9	246.0	14.0	120.2	9.9	SMJ
893	1A-1-1	872.3	8230.4	51.3	17.5	7.0	128.1	256.4	14.9	128.2	10.9	SMJ
894	1A-1-1	871.5	8097.9	57.8	16.7	11.3	147.3	176.9	20.8	111.7	10.6	EC
895	1A-1-1	874.5	8108.3	62.1	19.6	12.9	130.3	261.4	13.7	129.4	9.0	SMJ
896	1A-1-1	618.1	8015.2	34.9	16.8	8.6	122.3	243.0	19.4	114.1	8.1	SMJ
897	1A-1-1	580.5	6624.6	27.8	10.8	11.3	112.3	219.2	14.5	114.6	10.0	SMJ
898	1A-1-1	588.5	7662.4	168.8	26.4	7.4	123.3	246.7	17.8	118.5	10.6	SMJ
899	1A-1-1	749.2	8615.6	87.5	16.2	7.8	123.6	256.8	19.9	131.7	7.3	SMJ
900	1A-1-1	864.9	8591.7	67.8	15.9	13.2	124.6	240.6	13.0	117.8	9.9	SMJ

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
901	1A-1-1	800.4	8270.5	47.7	12.7	13.9	126.9	247.8	18.3	125.3	8.5	SMJ
902	1A-4-1	783.0	8420.0	68.5	17.1	9.9	122.5	251.1	15.9	118.6	8.9	SMJ
903	1A-4-1	807.9	8102.2	46.1	15.6	12.7	135.7	274.8	16.5	125.8	8.2	SMJ
904	1A-4-1	749.6	7826.7	65.9	18.7	17.5	169.6	195.2	20.3	125.0	11.4	EC
905	1A-4-1	894.7	7290.3	48.3	20.4	17.4	167.5	194.2	19.1	127.8	11.2	EC
906	1A-4-1	1584.2	12697.4	155.6	30.8	11.8	158.4	313.7	16.5	134.4	8.8	SMJ
907	1A-4-1	1016.4	9679.4	85.9	18.8	7.1	141.5	268.5	18.3	121.5	10.0	SMJ
908	1A-4-1	507.1	7958.1	54.2	20.7	8.6	124.8	246.2	16.4	123.6	8.5	SMJ
909	3A-1-2	1134.5	7861.2	66.1	14.4	13.2	166.7	183.3	16.6	115.9	10.5	EC
910	3A-1-2	862.1	7244.1	42.9	14.6	4.8	161.6	190.9	22.0	122.1	11.3	EC
911	3A-1-2	967.7	7174.4	55.9	19.7	7.1	113.4	238.6	18.2	112.7	13.1	SMJ
912	3A-1-2	1161.6	12207.2	108.6	19.4	9.0	161.3	272.0	16.6	126.9	8.3	SMJ
913	3A-1-2	712.1	7148.0	52.5	16.4	10.0	111.7	220.3	18.1	121.0	8.9	SMJ
914	3A-1-2	671.0	6854.0	52.5	16.4	12.2	144.6	176.2	22.4	115.8	11.0	EC
915	3A-1-2	789.3	7467.2	60.3	11.8	9.5	156.7	189.7	13.3	120.3	13.7	EC
916	3A-1 to 4	768.1	7103.8	44.7	15.1	6.3	117.3	213.4	18.1	117.6	9.7	SMJ
917	3A-1 to 4	646.7	7752.0	31.3	15.8	14.5	125.8	245.5	17.2	128.3	9.0	SMJ
918	3A-1 to 4	1117.4	8173.3	63.9	20.1	13.9	163.8	196.2	20.9	127.1	12.4	EC
919	3A-1 to 4	1065.4	8601.1	65.3	18.8	11.1	183.0	204.0	21.3	128.8	9.1	EC
920	3A-1 to 4	762.7	8317.1	52.6	13.8	16.9	158.7	170.6	25.9	119.1	11.1	EC
921	3A-1 to 4	852.4	6638.9	58.9	17.5	15.9	111.4	221.9	12.9	119.1	10.4	SMJ
922	3A-1 to 4	747.3	7307.8	55.5	13.9	6.6	105.4	233.7	12.8	118.2	11.0	SMJ
923	3A-1 to 4	720.3	8580.4	46.4	19.4	7.5	126.4	256.5	15.4	124.2	12.2	SMJ
924	3A-1 to 4	872.0	8742.5	58.4	18.9	8.3	126.7	262.7	15.6	123.7	10.1	SMJ
925	3A-1 to 4	559.0	8625.6	57.8	16.0	9.1	140.2	260.6	13.2	124.4	10.7	SMJ
926	3A-1 to 4	529.5	6872.9	52.1	19.5	8.7	117.6	228.0	13.3	110.8	8.0	SMJ
927	3A-1 to 4	789.3	7511.8	60.7	12.5	15.0	126.5	234.3	17.7	118.6	7.2	SMJ
928	3A-2-1	639.9	7127.6	36.7	15.0	10.0	104.3	233.1	19.4	120.9	11.6	SMJ
929	3A-2-1	677.2	8043.0	62.5	16.2	9.7	126.7	251.5	16.9	122.9	7.5	SMJ
930	3A-2-1	923.1	6605.7	55.2	14.9	15.8	159.7	182.1	19.9	116.8	11.9	EC
931	3A-2-1	916.9	8134.8	64.6	22.4	11.8	121.3	240.5	19.9	130.6	10.3	SMJ
932	3A-2-1	837.5	6751.0	38.5	14.0	5.2	117.0	232.9	12.1	119.5	11.2	SMJ
933	3A-2-1	994.4	11035.3	107.0	21.3	12.4	146.8	288.4	17.9	127.5	12.6	SMJ
934	3A-2-1	958.0	6971.2	39.7	19.6	6.8	116.4	205.8	15.6	110.1	8.9	SMJ
935	2A-0-0	919.0	7192.6	40.8	14.4	8.6	115.0	240.4	13.2	122.2	8.0	SMJ
936	2A-0-0	931.4	6796.7	53.6	19.8	10.4	116.0	218.2	12.1	112.8	8.9	SMJ
937	2A-0-0	871.8	7097.6	62.7	17.9	14.2	155.4	187.2	18.6	131.4	11.4	EC
938	2A-0-0	849.7	6405.7	53.5	18.8	11.8	157.6	192.4	22.1	112.6	9.3	EC
939	2A-0-0	1073.1	9418.7	72.0	19.4	11.2	119.3	262.8	19.1	113.0	7.1	SMJ
940	2A-0-0	808.4	6863.7	46.7	16.3	16.0	155.2	176.0	17.5	121.2	14.6	EC
941	2A-0-0	740.3	6778.8	43.7	18.6	6.8	122.8	213.6	14.3	114.4	9.3	SMJ
942	1A-0-0	640.7	6924.5	63.3	20.7	8.1	112.5	233.9	16.1	122.6	12.3	SMJ
943	1A-0-0	1080.9	7251.5	34.3	17.4	9.7	168.7	191.2	22.2	118.7	10.8	EC
944	1A-0-0	882.1	7386.3	56.6	20.6	9.4	112.8	252.8	15.7	125.0	8.8	SMJ
945	1A-0-0	986.6	7709.6	69.5	12.8	20.0	172.0	189.5	21.1	117.2	12.5	EC
946	1A-0-0	672.4	6769.0	54.7	18.6	16.2	169.4	175.6	19.9	118.9	12.7	EC
947	1A-0-0	821.5	7713.5	56.6	11.7	16.2	163.7	191.6	24.0	121.9	12.3	EC
948	1A-0-0	863.3	6782.8	44.7	12.9	10.0	165.1	193.7	15.8	118.3	11.9	EC

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
949	1A-0-0	934.5	7922.7	58.3	15.2	10.8	155.0	192.5	14.3	114.5	13.7	EC
950	1A-0-0	703.6	7683.7	278.9	14.7	4.2	103.2	228.5	14.1	106.9	7.9	SMJ
951	1A-0-0	584.4	6765.9	40.4	12.3	9.6	107.7	223.9	11.3	105.7	8.5	SMJ
952	1A-0-0	478.7	6769.1	42.4	10.4	4.3	103.0	206.0	17.1	113.6	7.3	SMJ
953	1A-0-0	623.9	7026.6	166.4	13.1	12.5	108.6	196.8	14.1	105.2	9.1	SMJ
954	1A-0-0	730.5	8908.3	338.0	15.5	9.2	117.6	230.1	11.7	111.9	5.8	SMJ
955	1A-0-0	650.0	6414.7	42.0	18.1	7.8	101.6	212.3	14.8	120.4	7.8	SMJ
956	1A-0-0	935.0	7869.2	60.7	17.3	14.8	127.4	247.2	13.9	122.0	8.7	SMJ
957	1A-0-0	791.0	7709.5	105.1	12.0	9.0	107.5	225.5	13.7	113.5	8.6	SMJ
958	1E-1-1	902.9	8094.4	59.7	13.3	11.7	184.9	185.3	26.8	128.3	10.7	EC
959	1E-1-1	906.4	7597.1	55.1	21.0	10.4	176.1	194.4	19.8	134.2	9.8	EC
960	1E-1-1	754.1	8778.6	48.1	12.7	12.3	132.5	263.5	15.6	123.5	8.4	SMJ
961	1E-1-1	736.3	8073.7	54.0	14.1	11.2	130.4	261.7	13.5	113.4	9.2	SMJ
962	1E-1-1	893.6	7210.1	68.3	14.5	5.5	122.5	235.3	12.9	120.2	10.0	SMJ
963	1E-1-1	727.0	6657.7	33.8	13.9	14.0	154.3	182.6	18.0	117.7	9.1	EC
964	1E-1-1	830.0	8485.1	44.3	19.1	9.4	120.9	238.8	18.8	125.3	7.7	SMJ
965	1E-1-1	881.5	8061.0	57.5	19.0	16.1	156.3	185.5	22.9	120.9	14.8	EC
966	1E-1-1	858.9	6944.2	59.8	23.5	11.5	138.4	177.8	27.7	112.0	11.4	EC
967	3A-2-2	875.7	7716.2	39.4	15.8	11.8	127.6	239.6	15.0	115.3	9.2	SMJ
968	3A-2-2	892.7	8880.8	49.6	18.9	18.2	176.2	205.1	19.7	128.2	10.5	EC
969	3A-2-2	800.1	8701.2	66.8	19.3	11.1	126.9	262.9	15.7	125.1	11.9	SMJ
970	3A-2-2	957.4	7588.1	67.0	22.0	16.0	166.2	191.6	18.7	120.3	14.2	EC
971	3A-2-2	976.9	8721.8	57.1	19.1	12.5	134.6	264.8	13.4	127.7	10.2	SMJ
972	3A-2-2	803.1	8164.8	57.0	16.8	17.0	121.5	208.9	18.2	98.6	6.3	SMJ
973	3A-2-2	555.1	7758.4	51.8	16.2	10.6	120.1	243.1	20.3	124.1	7.5	SMJ
974	3A-2-2	686.3	6791.2	41.0	16.9	7.0	121.5	222.0	16.4	122.5	9.1	SMJ
975	1A-1 to 5	634.9	8861.9	59.6	15.5	12.0	123.7	252.3	15.2	120.3	13.0	SMJ
976	1A-2-2	800.2	6877.3	60.9	21.0	9.3	114.0	244.7	15.1	127.8	11.3	SMJ
977	1A-2-2	671.1	7742.6	22.5	15.6	14.4	117.4	235.6	13.5	120.5	9.2	SMJ
978	1A-2-2	845.8	6910.3	54.4	21.0	13.2	161.3	186.1	17.8	122.2	13.1	EC
979	1A-2-2	800.1	8692.2	77.7	17.8	12.9	135.9	267.3	18.0	133.0	8.9	SMJ
980	1A-2-1	874.3	6718.8	43.0	18.4	9.7	152.6	176.7	19.2	118.0	7.3	EC
981	1A-2-1	634.7	6457.3	53.5	14.6	6.4	110.3	217.1	17.8	114.9	9.9	SMJ
982	1A-2-1	891.5	7666.3	40.1	9.9	8.5	115.9	236.0	17.2	118.5	8.3	SMJ
983	1A-2-1	654.2	7604.9	24.0	12.2	3.7	107.0	214.2	14.4	124.4	9.9	SMJ
984	1A-1-2	696.1	9121.2	45.1	15.1	4.8	132.2	262.5	14.1	119.8	11.7	SMJ
985	1A-1-2	545.0	8398.5	67.3	14.4	8.7	127.8	249.0	13.8	112.8	9.4	SMJ
986	1A-1-2	521.1	7054.3	56.4	10.5	6.4	108.5	230.1	17.0	113.9	7.0	SMJ
987	1A-1-2	564.2	8500.2	56.8	17.0	7.1	124.6	257.4	16.8	118.6	6.9	SMJ
988	1A-1-2	600.7	6979.4	40.2	12.0	8.8	112.2	244.8	10.8	111.1	7.2	SMJ
989	1A-3-2	699.6	6659.8	44.7	17.2	9.6	137.5	163.2	22.8	104.8	9.4	EC
990	1A-3-2	641.7	7449.1	31.3	7.7	6.7	115.1	223.9	15.4	109.5	7.2	SMJ
991	1A-3-2	772.4	6372.4	37.1	5.9	5.5	103.1	200.9	6.2	104.0	3.0	SMJ
992	1C-1-2	473.2	7420.1	37.0	12.4	5.6	137.6	160.2	14.1	105.5	10.8	EC
993	1C-1-2	254.7	6027.3	41.8	8.6	8.7	129.4	144.0	15.5	98.1	7.1	EC
994	1C-1-3	707.5	7445.4	31.4	8.2	20.8	145.9	167.3	10.8	105.5	14.3	EC
995	1A-5-1	496.8	6521.0	27.1	10.5	5.6	145.2	155.7	16.1	105.1	10.2	EC
996	1A-5-2	547.3	8046.9	47.2	9.7	9.0	117.5	232.6	13.1	106.8	7.5	SMJ

Table C.1 (Continued)

ID#	Lot	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Source
997	1A-5-2	316.0	7079.3	44.2	11.5	7.8	108.7	217.8	11.9	97.6	5.1	SMJ
998	3A-2-3	417.0	4910.6	28.6	13.3	4.4	110.6	128.2	14.9	86.1	8.7	EC
999	1E-1-2	197.9	7545.4	44.2	13.9	0.3	101.7	199.5	12.3	91.6	4.8	SMJ
1000	1E-1-2	792.6	7961.9	59.4	11.2	12.4	165.4	175.7	16.7	110.5	8.7	EC
1001	1E-1-2	410.4	9598.8	49.5	13.5	4.4	111.5	211.4	11.1	109.4	7.6	SMJ
1002	1E-1-2	276.1	8338.1	45.1	11.5	7.2	115.8	224.5	12.5	105.1	7.5	SMJ
1003	1E-1-2	240.6	6182.4	16.9	7.7	8.4	87.6	199.5	13.7	96.3	6.6	SMJ
1004	1E-1-2	307.5	6463.3	30.9	15.2	5.2	131.2	139.4	15.8	94.6	7.8	EC
1005	3A-3-2	585.4	5111.3	36.6	10.3	10.3	116.6	148.2	16.0	102.3	8.0	EC
1006	3A-3-1	594.8	6212.6	39.3	17.3	8.9	138.1	151.4	17.8	96.7	7.4	EC
1007	3A-0-0	338.1	7253.1	49.7	8.8	4.4	139.4	169.6	16.1	107.3	11.5	EC
1008	3A-1-1	339.7	6291.3	18.4	7.0	6.1	129.0	152.3	14.4	94.3	5.2	EC
1009	3A-4-2	457.3	6235.1	21.9	13.8	8.2	143.6	162.7	9.9	97.6	8.4	EC
1010	3A-4-1	377.8	5726.0	43.5	11.8	2.0	85.9	187.5	8.4	103.7	6.7	SMJ
1011	3A-4-1	517.1	7545.8	20.7	10.4	11.4	130.3	161.5	17.7	106.0	6.7	EC
1012	3A-4-1	338.2	6494.8	30.6	12.3	6.5	98.0	198.1	16.4	109.0	9.0	SMJ

Table C.2 Obsidian typological analysis for pieces from Rancho Búfalo, Chiapas, Mexico.
All measurements are reported in millimeters. All weights are reported in grams.

Table C.2

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_001	9B-1-2	42.3	12.5	3.1	2.1	Blade
RB_002	9B-1-2	13.7	11.42	3.1	0.62	Blade
RB_003	9B-1-2	12.2	14.3	3.8	0.62	Flake
RB_004	9B-2-1	22.2	11	7.8	1.26	Expended Core
RB_005	9B-2-1	20	12.1	3.4	0.83	Blade
RB_006	9B-2-1	8.3	13	3.8	0.32	Blade
RB_007	9B-2-1	16.7	8.4	1.3	0.19	Blade
RB_008	9B-2-1	6.8	9.2	1.54	0.05	Flake
RB_009	13A-2-2	16.5	10.4	6	0.67	Expended Core
RB_010	13A-2-2	20.7	6.4	4.8	0.55	Expended Core
RB_011	13A-2-2	14.8	6.9	1.9	0.2	Blade
RB_012	13A-2-2	15.2	9.8	2.1	0.34	Blade
RB_013	13A-2-2	8.9	7.5	2.1	0.19	Blade
RB_014	13A-2-2	7.7	6.7	1.4	0.08	Blade
RB_015	13A-2-2	8	6.7	1.7	0.1	Blade
RB_016	13A-2-2	12	8.5	1.7	0.15	Blade
RB_017	13A-2-2	10.2	6.3	2	0.12	Blade
RB_018	13A-2-2	10.5	6	1.7	0.11	Blade
RB_019	13A-2-2	9.3	5.7	0.9	0.04	Blade
RB_020	13A-2-2	6	10	1.2	0.06	Blade
RB_021	13A-2-2	6	10.8	1.2	0.06	Preparation Flake
RB_022	13A-2-2	5.9	12.3	0.9	0.05	Preparation Flake
RB_023	13A-2-2	9.6	10.2	1.8	0.12	Debitage
RB_024	13A-2-2	6.5	8.2	2.2	0.12	Debitage
RB_025	13A-2-2	6.5	8	2.5	0.08	Debitage
RB_026	13A-2-2	10.3	5.5	2.3	0.09	Debitage
RB_027	9B-1-1	13.2	12	2.8	0.43	Blade
RB_028	9B-1-1	18.4	5.1	1.3	0.11	Blade
RB_029	9B-1-1	20	12.7	2.5	0.96	Blade
RB_030	9B-1-1	6.4	12	3.2	0.27	Blade
RB_031	9B-1-1	17.7	11	3.2	0.7	Blade
RB_032	9B-1-1	16.3	15.1	3.6	0.86	Macroblade
RB_033	13A-2-1	20.8	9.5	2.7	0.56	Blade
RB_034	13A-2-1	17.8	8.9	2	0.27	Blade
RB_035	13A-2-1	7.6	5.8	1.7	0.06	Blade
RB_036	13A-2-1	8.3	5.3	1	0.05	Blade
RB_037	13A-2-1	8.9	13.9	2.6	0.25	Preparation Flake
RB_038	13A-2-1	10.6	15	2.9	0.47	Preparation Flake

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_039	13A-2-1	9.9	12.4	2.5	0.24	Preparation Flake
RB_040	13A-2-1	10.3	8.3	1.6	0.1	Preparation Flake
RB_041	13A-2-1	7.7	10.8	1.64	0.08	Preparation Flake
RB_042	9B-3-1	10.1	8.3	1.6	0.14	Reworked Blade
RB_043	9B-3-1	11	14	2.7	0.41	Reworked Blade
RB_044	9B-3-1	7	10.8	2	0.08	Debitage
RB_045	9B-2-2	24	15.6	3.5	1.66	Macroblade
RB_046	9B-2-2	16.6	10.1	3.8	0.59	Macroblade
RB_047	9B-2-2	26.9	12	3.1	1.13	Blade
RB_048	9B-2-2	21.1	10.1	3.2	0.65	Blade
RB_049	9B-2-2	12.3	12.8	3	0.47	Blade
RB_050	9B-2-2	14.2	13.3	2.8	0.62	Blade
RB_051	9B-2-2	23.6	21.3	4.9	2.02	Flake
RB_052	9B-2-2	20.2	17.9	3.7	0.89	Flake
RB_053	9B-2-2	26.2	15.7	4.5	1.17	Preparation Flake
RB_054	9B-2-2	8.8	13.7	2.2	0.24	Preparation Flake
RB_055	9B-2-2	10.6	8.5	2	0.13	Preparation Flake
RB_056	9B-2-2	9.3	13.2	2.1	0.19	Preparation Flake
RB_057	14A-1-3	18.4	11.5	1.7	0.43	Blade
RB_058	14A-1-3	10.7	13.9	2.1	0.31	Reworked Blade
RB_059	14A-1-3	8.5	12.5	2.4	0.31	Reworked Blade
RB_060	14A-1-3	9.9	14.7	3.2	0.34	Preparation Flake
RB_061	14A-1-3	19.9	8.2	2.3	0.46	Expended Core
RB_062	14C-1-2	14.5	8.3	1.6	0.14	Preparation Flake
RB_063	14C-1-2	8.3	11.5	3	0.22	Preparation Flake
RB_064	16A-1-2	15.2	11.2	3.4	0.53	Macroblade
RB_065	16A-1-2	33.4	7.5	1.7	0.62	Blade
RB_066	16A-1-2	18.2	9.8	3.4	0.52	Blade
RB_067	16A-1-2	16.6	6.5	1.7	0.26	Blade
RB_068	16A-1-2	6.1	8.2	1.6	0.1	Blade
RB_069	16A-1-2	14.2	10.4	2.7	0.34	Blade
RB_070	16A-1-2	14.5	10	2.3	0.49	Blade
RB_071	16A-1-2	14.2	7.8	2	0.24	Blade
RB_072	16A-1-2	16.1	5.8	1.5	0.18	Blade
RB_073	16A-1-2	23	10.2	4.3	0.73	Preparation Flake
RB_074	16A-1-2	14.5	9	3.2	0.26	Preparation Flake
RB_075	16A-1-2	14.2	8.7	3.4	0.38	Preparation Flake
RB_076	16A-1-2	8.8	7.3	2.2	0.08	Debitage
RB_077	16A-1-2	6.4	8.7	2.1	0.1	Debitage
RB_078	16A-1-2	10.2	5	1.6	0.05	Debitage
RB_079	15A-2-1	21.3	17.7	3.8	17	Macroblade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_080	15A-2-1	10.2	6.6	1.4	0.07	Preparation Flake
RB_081	17A-1-2	32.3	8.7	2.4	0.79	Blade
RB_082	17A-1-2	10.4	8.5	4.2	0.25	Preparation Flake
RB_083	17A-1-2	11.1	14.7	3.4	0.55	Preparation Flake
RB_084	13A-1-1	13.1	9.1	2.7	0.29	Blade
RB_085	14C-1-1	30.4	10.1	2.4	0.98	Blade
RB_086	14C-1-1	17.1	19.1	8	1.66	Preparation Flake
RB_087	14A-1-2	24.2	10.1	4	1.05	Macroblade
RB_088	14A-1-2	15.1	13	2.7	0.62	Macroblade
RB_089	14A-1-2	20.2	11.7	2.5	0.54	Blade
RB_090	14A-1-2	17.3	13.8	1.9	0.63	Blade
RB_091	14A-1-2	19.5	9.1	2.3	0.56	Blade
RB_092	14A-1-2	19.7	10.3	2.84	0.66	Blade
RB_093	14A-1-2	16.5	11	3	0.53	Blade
RB_094	14A-1-2	8	9.3	1.9	0.17	Blade
RB_095	14A-1-2	8.8	6.6	2.3	0.1	Debitage
RB_096	14A-1-2	11	8	3.2	0.22	Debitage
RB_097	17A-1-1	21.7	6.7	2	0.41	Blade
RB_098	6F-6-1	25.1	10.5	3	0.94	Blade
RB_099	6F-6-1	15.5	11	2.3	0.47	Blade
RB_100	6F-6-1	16.7	12	3.1	0.72	Blade
RB_101	6F-6-1	22.2	12.3	2.2	0.44	Flake
RB_102	6F-6-1	15	12.9	3.1	0.48	Flake
RB_103	6F-6-1	27	12.7	6.5	1.73	Debitage
RB_104	6F-1-1	13.6	15.9	4.7	1.06	Macroblade
RB_105	6F-1-1	18.6	7.7	2	0.28	Blade
RB_106	6F-1-1	18.5	10	2.1	0.44	Blade
RB_107	6F-1-1	14.4	11	1.8	0.3	Blade
RB_108	6F-1-1	11.4	10.3	1.9	0.32	Blade
RB_109	6F-1-1	6.5	7.3	1	0.04	Preparation Flake
RB_110	6F-1-1	9	4.4	3	0.1	Debitage
RB_111	6F-1-1	13.5	5	4.7	0.17	Debitage
RB_112	6F-3-1	11	11.5	3.3	0.42	Reworked Blade
RB_113	6F-3-1	6.6	12.2	3.2	0.24	Reworked Blade
RB_114	6F-3-1	10.9	7.2	3.1	0.13	Reworked Blade
RB_115	6F-10-1	16.9	12.3	2.7	0.6	Blade
RB_116	6F-10-1	10.1	7.2	2	0.15	Blade
RB_117	6F-10-1	8.1	8.7	2.6	0.24	Blade
RB_118	6F-10-1	12.2	6.4	1.5	0.09	Blade
RB_119	6F-10-1	7	8.2	2	0.13	Reworked Blade
RB_120	6F-10-1	9.6	17.2	4.2	0.5	Flake

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_121	6F-10-1	17.7	7.6	5.3	0.45	Debitage
RB_122	6F-10-1	22.9	10.4	8.7	2.49	Expended Core
RB_123	6F-12-1	12.4	14.1	4.1	0.86	Macroblade
RB_124	6F-12-1	18.8	9.5	1.9	0.45	Blade
RB_125	6F-12-1	18.3	10.2	2.4	0.43	Blade
RB_126	6F-12-1	15.5	8.6	4.8	0.7	Debitage
RB_127	6F-12-1	10.3	7.9	2.2	0.11	Debitage
RB_128	6F-7-1	9.7	7.2	1.5	0.14	Blade
RB_129	6F-7-1	13.7	14.6	3	0.48	Reworked Blade
RB_130	6F-7-1	11.7	18.2	3.2	0.55	Preparation Flake
RB_131	6F-8-1	34.9	24.6	8.2	4.95	Monoface
RB_132	6F-8-1	19.3	11.8	2.2	0.54	Blade
RB_133	6F-4-1	16.7	9.1	2.4	0.41	Blade
RB_134	6F-4-1	9.7	8	2.3	0.19	Blade
RB_135	6F-4-1	11.2	10.6	2.4	0.28	Blade
RB_136	6F-4-1	18	6.6	2	0.26	Blade
RB_137	6F-4-1	11.2	6.5	2.3	0.2	Preparation Flake
RB_138	6F-4-1	6.8	5.4	1.2	0.07	Preparation Flake
RB_139	6F-5-1	15	9.6	1.9	0.42	Blade
RB_140	6F-5-1	25.8	8.1	2.2	0.65	Blade
RB_141	6F-5-1	9.9	9.1	1.5	0.15	Blade
RB_142	6F-5-1	5.7	5.9	1.6	0.08	Reworked Blade
RB_143	6F-5-1	17	11.8	3.7	0.45	Preparation Flake
RB_144	6F-5-1	19.6	13.2	7.2	1.12	Expended Core
RB_145	6F-9-1	8.4	6.5	1.6	0.08	Reworked Blade
RB_146	6F-9-1	10.4	11	2.7	0.26	Preparation Flake
RB_147	6F-9-1	8.5	5.1	1.2	0.05	Debitage
RB_148	6F-2-1	19.3	14.9	2.4	0.66	Macroblade
RB_149	6F-2-1	15	11.4	1.9	0.45	Macroblade
RB_150	6F-2-1	16.8	13	2.7	0.71	Blade
RB_151	6F-2-1	25.5	11	3	0.95	Blade
RB_152	6F-2-1	13.4	13.4	2.8	0.58	Blade
RB_153	6F-2-1	15	8.4	1.6	0.33	Blade
RB_154	6F-2-1	11.1	6.7	1.9	0.2	Blade
RB_155	6F-2-1	15.5	13	3.1	0.69	Blade
RB_156	6F-2-1	11.7	9.1	2.8	0.3	Blade
RB_157	6F-2-1	9.2	12.9	3.8	0.43	Blade
RB_158	6F-2-1	18.8	5.5	2	0.23	Blade
RB_159	6F-2-1	18.8	8.9	1.8	0.4	Blade
RB_160	6F-2-1	7.1	12.2	2.9	0.2	Reworked Blade
RB_161	6F-2-1	8.4	7.4	1.4	0.08	Reworked Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_162	6F-2-1	9.8	7.2	1.1	0.07	Debitage
RB_163	6F-2-1	7	6	2	0.06	Debitage
RB_164	6F-2-1	10	6	1.4	0.07	Debitage
RB_165	3B-1-1	20.9	11.9	2.8	0.84	Blade
RB_166	3B-1-1	16.6	11.8	3.2	0.68	Blade
RB_167	3B-1-1	17.1	8.2	1.8	0.32	Blade
RB_168	3B-1-1	18.9	8.1	2.5	0.41	Blade
RB_169	3B-1-1	33.6	9.5	3.4	0.99	Blade
RB_170	3B-1-1	18.2	12.9	2.6	0.53	Blade
RB_171	3B-1-1	24.3	12.8	3.8	1.18	Blade
RB_172	3B-1-1	12.9	13.2	2.1	0.35	Blade
RB_173	3B-1-1	7.2	9.7	1.9	0.12	Flake
RB_174	1H-8-4	26.6	9	2.4	0.72	Blade
RB_175	1H-8-4	17.4	10.3	1.6	0.28	Blade
RB_176	1H-8-5	19.9	19.6	4.7	1.62	Macroblade
RB_177	1H-8-5	17.2	11.2	3	0.73	Blade
RB_178	1H-8-5	15.2	12.2	3.1	0.62	Blade
RB_179	1H-8-5	22.78	8.7	2.2	0.48	Blade
RB_180	1H-12-1	12.4	10.1	2.7	0.4	Blade
RB_181	1H-12-1	20.3	9.3	2.4	0.53	Blade
RB_182	1H-12-1	17.7	5.1	1.1	0.12	Blade
RB_183	1H-12-1	35.5	11.8	4.7	1.7	Monoface
RB_184	1H-12-1	16.4	12.5	4	0.62	Preparation Flake
RB_185	1H-12-1	13.7	8.4	3.4	0.3	Preparation Flake
RB_186	1H-12-1	11.8	5	5.8	0.23	Debitage
RB_187	1H-1-1	25.9	4.6	1.9	0.27	Blade
RB_188	1H-1-1	12.7	9.3	1.6	0.25	Blade
RB_189	1H-1-1	19	10.8	2.2	0.63	Blade
RB_190	1H-1-1	23.3	9.8	1.6	0.52	Blade
RB_191	1H-1-1	19.8	10.1	2.6	0.68	Blade
RB_192	1H-1-1	13.9	6.7	2.8	0.27	Blade
RB_193	1H-1-1	11.4	12.2	4.2	0.48	Reworked Blade
RB_194	1H-1-1	13	15.3	3	0.58	Reworked Blade
RB_195	1H-1-1	9.9	6.5	4.1	0.2	Debitage
RB_196	1H-8-6	16.1	19.2	3.8	1.04	Flake
RB_197	1H-8-6	16.6	9.3	3.9	0.48	Flake
RB_198	1H-8-6	14.2	13	2	0.32	Preparation Flake
RB_199	1H-5-1	23.9	10.3	2.6	0.77	Blade
RB_200	1H-5-1	16.7	11.8	3.1	0.79	Blade
RB_201	1H-5-1	13	9.2	3.1	0.43	Blade
RB_202	1H-5-1	6.1	5.7	2.1	0.11	Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_203	1H-5-1	20.2	13.8	2.8	1.02	Reworked Blade
RB_204	1H-5-1	16.6	15.4	2.3	0.53	Reworked Blade
RB_205	1H-5-1	7	11	3.5	0.3	Reworked Blade
RB_206	3B-1-2	15.9	8.7	2.8	0.31	Blade
RB_207	3B-1-2	25.3	10	2.6	0.86	Blade
RB_208	3B-1-2	20	10.8	2.3	0.6	Blade
RB_209	3B-1-2	22.8	9.3	1.8	0.52	Blade
RB_210	3B-1-2	18.5	8.5	2.1	0.39	Blade
RB_211	3B-1-2	9.3	10.1	1.7	0.22	Blade
RB_212	3B-1-2	16.4	6.4	2.3	0.22	Blade
RB_213	3B-1-2	14.7	10.8	2.6	0.35	Blade
RB_214	3B-1-2	18	8.5	2.5	0.34	Reworked Blade
RB_215	3B-1-2	16	10.7	3.1	0.55	Reworked Blade
RB_216	3B-1-2	18.4	8.3	3.5	0.63	Reworked Blade
RB_217	3B-1-2	11.4	9.9	2.1	0.19	Reworked Blade
RB_218	3B-1-2	14.9	14	3.5	0.54	Reworked Blade
RB_219	3B-1-2	14.3	8	1.8	0.2	Flake
RB_220	3B-1-2	13.2	8	1	0.12	Preparation Flake
RB_221	3B-1-2	10	8.3	3.6	0.3	Debitage
RB_222	3B-1-2	8	7.9	2.1	0.11	Debitage
RB_223	3B-1-2	18.6	15.1	7.3	1.81	Expended Core
RB_224	1J-1-1	47	18.1	4.4	4.16	Macroblade
RB_225	1J-1-1	12.7	13	2	0.44	Blade
RB_226	1J-1-1	15	8	1.9	0.31	Blade
RB_227	1J-1-1	20.2	13.2	3.5	1.15	Blade
RB_228	1J-1-1	18.2	13.7	4.1	0.8	Reworked Blade
RB_229	1J-1-1	8.7	7.6	1.7	0.09	Debitage
RB_230	1J-1-1	22.3	5.2	2.2	0.28	Blade
RB_231	1F-1-1	13.3	21.8	3.4	1.13	Macroblade
RB_232	1F-1-1	17.3	14.8	3.6	1.07	Macroblade
RB_233	1F-1-1	29.6	12.7	2.5	1.16	Blade
RB_234	1F-1-1	19.1	11	1.9	0.53	Blade
RB_235	1F-1-1	14.1	7.2	2.2	0.32	Blade
RB_236	1F-1-1	18.2	8.9	2.4	0.5	Blade
RB_237	1F-1-1	8.8	12.8	2.5	0.29	Blade
RB_238	1F-1-1	10.4	7	2	0.2	Blade
RB_239	1F-1-1	19.5	9.7	1.4	0.24	Blade
RB_240	1F-1-1	20.3	12.3	2.2	0.55	Blade
RB_241	1F-1-1	10.8	7.7	1.7	0.16	Blade
RB_242	1F-1-1	18	10.4	2.2	0.48	Reworked Blade
RB_243	1F-1-1	12.9	7.8	1.7	0.16	Reworked Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_244	1F-1-1	16.3	6.9	3	0.19	Reworked Blade
RB_245	1F-1-1	10.9	6.4	2.1	0.17	Reworked Blade
RB_246	1J-1-4	23.4	7.8	2.3	0.46	Blade
RB_247	1J-1-4	24.6	7.6	2.3	0.51	Blade
RB_248	1J-1-4	16.7	7.5	2.3	0.35	Blade
RB_249	1J-1-4	27.2	11.2	2.9	1.12	Blade
RB_250	1J-1-4	31	8.8	2.8	0.91	Blade
RB_251	1J-1-4	10.7	8.8	3.2	0.3	Blade
RB_252	1J-1-4	11.2	8.8	2.3	0.21	Reworked Blade
RB_253	1J-1-4	11.8	9.5	1.3	0.09	Preparation Flake
RB_254	1H-9-2	22	14.2	2.7	1.15	Macroblade
RB_255	1H-9-2	21	9.4	2.4	0.6	Blade
RB_256	1H-9-2	22.9	9.7	3	0.73	Blade
RB_257	1H-9-2	24.3	8.8	1.8	0.56	Blade
RB_258	1H-9-2	16.3	10.1	2.7	0.5	Blade
RB_259	1H-9-2	15.2	5.3	1.9	0.15	Blade
RB_260	1H-9-2	9.7	7.8	2	0.19	Blade
RB_261	1H-9-2	9.6	14.2	2.7	0.39	Reworked Blade
RB_262	1H-9-2	13.3	9.8	1.6	0.21	Flake
RB_263	1H-9-2	11.9	9.8	1.3	0.13	Preparation Flake
RB_264	1H-9-2	11.4	6.3	2.4	0.11	Preparation Flake
RB_265	1J-1-3	22	15	2.7	1.34	Macroblade
RB_266	1J-1-3	29.5	11.7	3.6	1.38	Blade
RB_267	1J-1-3	15.5	11.4	3	0.58	Blade
RB_268	1J-1-3	21.3	7.6	3.1	0.57	Blade
RB_269	1J-1-3	21.6	8.6	1.9	0.23	Blade
RB_270	1J-1-3	16.6	6	1.7	0.15	Blade
RB_271	1J-1-3	12.1	8.4	1.1	0.13	Blade
RB_272	1J-1-3	11	15.2	3	0.34	Reworked Blade
RB_273	1J-1-3	17.5	13.9	2.7	0.57	Flake
RB_274	1J-1-3	16	14.5	3	0.51	Flake
RB_275	1J-1-3	17.7	13.5	3.3	0.7	Flake
RB_276	1J-1-3	9.2	8.6	3.2	0.2	Preparation Flake
RB_277	1J-1-3	11.3	12	3	0.26	Preparation Flake
RB_278	1J-1-3	8.7	3.8	4.43	0.07	Debitage
RB_279	1H-9-1	21.9	9.5	2.6	0.5	Blade
RB_280	1H-9-1	12.1	5.4	2.3	0.12	Blade
RB_281	1H-9-1	8.9	9.8	1.8	0.13	Blade
RB_282	1H-9-1	11.3	7.3	1.7	0.12	Reworked Blade
RB_283	1H-9-1	8.7	10.5	2.5	0.21	Reworked Blade
RB_284	1H-9-1	12.6	9.2	2.7	0.28	Reworked Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_285	1H-8-2	32.9	9.6	2.8	0.99	Blade
RB_286	1H-8-2	35.8	10.8	2.4	1.17	Blade
RB_287	1H-8-2	22.2	6.8	3.1	0.45	Blade
RB_288	1H-8-2	28.9	8.8	2.8	0.87	Blade
RB_289	1H-8-2	16.8	10	1.9	0.44	Blade
RB_290	1H-8-2	16	10.8	2.8	0.63	Blade
RB_291	1H-8-2	14.9	10.8	1.5	0.27	Blade
RB_292	1H-8-2	17.9	9.4	2.1	0.46	Blade
RB_293	1H-8-2	23.9	11.5	2.6	0.78	Blade
RB_294	1H-8-2	20.8	12.3	3.1	0.76	Monoface
RB_295	1H-8-2	10.4	9.4	2.8	0.23	Reworked Blade
RB_296	1H-8-2	9.7	12.6	2.1	0.23	Reworked Blade
RB_297	1H-8-2	8.3	8	2.7	0.17	Reworked Blade
RB_298	1H-8-2	21.7	21.1	8	3.56	Expended Core
RB_299	1H-12-1	10.7	12.7	2.9	0.44	Blade
RB_300	1H-12-1	26.6	13.1	2.9	1.13	Blade
RB_301	1H-12-1	10.5	8.4	2.3	0.16	Blade
RB_302	1H-12-1	10.2	8.8	2.4	0.2	Blade
RB_303	1H-12-1	13	9.1	2.1	0.28	Blade
RB_304	1H-12-1	14.2	11.5	2.4	0.47	Blade
RB_305	1H-12-1	18.2	8.9	2.3	0.48	Blade
RB_306	1H-12-1	16.9	10.4	2.9	0.59	Blade
RB_307	1H-12-1	20	7.7	2.3	0.38	Blade
RB_308	1H-12-1	17.4	7.6	2.5	0.27	Blade
RB_309	1H-12-1	10.9	8.4	1.7	0.11	Blade
RB_310	1H-12-1	17.9	8.9	2.3	0.42	Reworked Blade
RB_311	1H-12-1	8.5	10.6	2.6	0.29	Reworked Blade
RB_312	1H-12-1	37.1	9.1	3.6	1.27	Reworked Blade
RB_313	1H-12-1	8.2	11.7	2.1	0.2	Reworked Blade
RB_314	1H-12-1	16.5	10.3	3.4	0.55	Reworked Blade
RB_315	1H-12-1	18.5	8.5	2.3	0.3	Reworked Blade
RB_316	1H-12-1	13	9.9	3	0.33	Reworked Blade
RB_317	1H-12-1	22.1	11.5	5.1	1.24	Flake
RB_318	1H-12-1	22.9	17.6	4.2	1.4	Flake
RB_319	1H-12-1	19.3	14.3	2.9	0.7	Flake
RB_320	1H-12-1	9.8	11.8	2.3	0.21	Preparation Flake
RB_321	1H-12-1	13.6	10.4	0.9	0.11	Preparation Flake
RB_322	1H-12-1	8.1	9.2	1.9	0.09	Preparation Flake
RB_323	1F-1-4	9.3	21.3	5.1	0.95	Macroblade
RB_324	1H-1-2	22.1	11.5	2.9	0.66	Macroblade
RB_325	1H-1-2	30.6	8.2	2.4	0.66	Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_326	1H-1-2	17.8	11.7	2.4	0.64	Blade
RB_327	1H-1-2	14.9	9.7	2.4	0.43	Blade
RB_328	1H-1-2	11.5	11.7	1.9	0.35	Blade
RB_329	1H-1-2	11.4	8.9	2.2	0.39	Blade
RB_330	1H-1-2	8.7	11.3	2.2	0.29	Blade
RB_331	1H-1-2	8.4	5.2	1.5	0.08	Blade
RB_332	1H-1-2	11.5	9.6	1.5	0.21	Blade
RB_333	1H-1-2	19.5	9.6	2.7	0.65	Reworked Blade
RB_334	1H-1-2	10.7	12.8	2.1	0.32	Reworked Blade
RB_335	1H-1-2	13.6	7.8	1.8	0.19	Reworked Blade
RB_336	1H-1-2	23.5	16.2	4.7	1.91	Monoface
RB_337	1H-1-2	28.13	13.2	3.5	1.36	Monoface
RB_338	1H-8-3	13	11.6	2.2	0.48	Blade
RB_339	1H-8-3	14.7	11.2	2.6	0.44	Blade
RB_340	1F-1-2	18.2	15.8	2.6	0.56	Macroblade
RB_341	1F-1-2	23.6	13	1.8	0.67	Macroblade
RB_342	1F-1-2	15.5	11.8	2.5	0.55	Blade
RB_343	1F-1-2	14.4	10.5	2.7	0.48	Blade
RB_344	1F-1-2	18.1	12.8	2.3	0.75	Blade
RB_345	1F-1-2	20.9	11	2.9	0.82	Blade
RB_346	1F-1-2	7.2	9	2.6	0.22	Blade
RB_347	1F-1-2	21.2	8.8	2.2	0.49	Blade
RB_348	1F-1-2	17.1	7.2	1.3	0.12	Blade
RB_349	1F-1-2	28.1	22.1	5.8	2.44	Flake
RB_350	1F-1-2	15.9	25.8	5.8	1.82	Flake
RB_351	1F-1-2	18.6	13.8	3.2	0.68	Flake
RB_352	1F-1-2	13.7	7.7	3.4	0.41	Reworked Blade
RB_353	1F-1-2	14.1	8.7	2.7	0.36	Reworked Blade
RB_354	1F-1-2	8.9	8.8	2.3	0.23	Reworked Blade
RB_355	1F-1-2	12.8	8.8	1.4	0.13	Preparation Flake
RB_356	1F-1-2	11.8	14.2	4.2	0.59	Preparation Flake
RB_357	1F-1-2	11	10.8	2.6	0.25	Preparation Flake
RB_358	1H-1-3	28.4	11.9	3	0.92	Blade
RB_359	1H-1-3	14.8	11	2.4	0.49	Blade
RB_360	1H-1-3	17.1	10.3	2	0.45	Blade
RB_361	1H-1-3	7.9	7.4	1.7	0.13	Blade
RB_362	1H-1-3	13.7	7.4	2	0.22	Blade
RB_363	1H-1-3	32	10	2	0.8	Blade
RB_364	1H-1-3	17.6	9.6	2.1	0.39	Blade
RB_365	1H-1-3	15.7	11.9	2	0.4	Blade
RB_366	1H-1-3	17.4	9.7	1.9	0.38	Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_367	1H-1-3	11.7	7.2	1.9	0.14	Blade
RB_368	1H-1-3	21.4	7.2	2.4	0.43	Reworked Blade
RB_369	1H-1-3	13	11.7	2.4	0.35	Reworked Blade
RB_370	1H-1-3	15.6	11	2	0.44	Reworked Blade
RB_371	1H-1-3	11.3	7.3	3.9	0.29	Reworked Blade
RB_372	1H-1-3	23.3	19.3	5.2	1.65	Flake
RB_373	1H-1-3	15.5	14.3	3.3	0.8	Flake
RB_374	1H-1-3	12	10.4	2.5	0.21	Preparation Flake
RB_375	1H-1-3	8.1	8.5	2.4	0.12	Preparation Flake
RB_376	1H-1-3	18	15.6	9.5	2.13	Preparation Flake
RB_377	1H-1-3	10.1	15.5	4.1	0.63	Preparation Flake
RB_378	1H-1-3	13.1	3.5	2.8	0.12	Debitage
RB_379	1H-1-3	5.8	10	2	0.12	Debitage
RB_380	1H-5-2	13.9	10.9	3.4	0.4	Blade
RB_381	1H-5-2	16.6	9.4	2.5	0.4	Blade
RB_382	1H-5-2	26.6	9.1	2.9	0.85	Blade
RB_383	1H-5-2	18.8	12.2	1.9	0.54	Blade
RB_384	1H-5-2	21.6	8.5	1.9	0.37	Blade
RB_385	1H-5-2	24.5	18.2	2.1	0.34	Blade
RB_386	1H-5-2	14.8	3	0.9	0.04	Blade
RB_387	1H-5-2	14	7.1	2	0.21	Blade
RB_388	1H-5-2	16.6	14	2.8	0.61	Reworked Blade
RB_389	1H-5-2	15.1	10.8	3.6	0.6	Reworked Blade
RB_390	1H-5-2	11.4	7.6	3	0.16	Reworked Blade
RB_391	1H-5-2	13.4	13.6	2.3	0.49	Reworked Blade
RB_392	1H-5-2	23.9	6.7	3.8	0.54	Reworked Blade
RB_393	1H-5-2	16.3	5.6	2.5	0.22	Reworked Blade
RB_394	1H-5-2	10.1	10.9	3.2	0.25	Reworked Blade
RB_395	1J-1-2	25.1	9.8	2.6	0.87	Blade
RB_396	1J-1-2	20.8	10.4	2.1	0.62	Blade
RB_397	1J-1-2	22.7	6	2	0.33	Blade
RB_398	1J-1-2	17.6	10.6	2.7	0.55	Blade
RB_399	1J-1-2	13.3	10.5	1.49	0.25	Blade
RB_400	1J-1-2	29.1	9	1.8	0.57	Blade
RB_401	1J-1-2	17.3	9.5	1.9	0.42	Blade
RB_402	1J-1-2	20.9	8	2.7	0.56	Blade
RB_403	1J-1-2	14	4.7	1.8	0.12	Blade
RB_404	1J-1-2	14.2	13.9	3.6	0.65	Reworked Blade
RB_405	1J-1-2	11.5	13.1	3.9	0.61	Reworked Blade
RB_406	1J-1-2	19.2	12.2	4.3	0.82	Reworked Blade
RB_407	1J-1-2	15.6	8.8	2	0.25	Reworked Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_408	1J-1-2	15	6.5	2.7	0.23	Reworked Blade
RB_409	1J-1-2	21.8	6.4	2.5	0.34	Reworked Blade
RB_410	1J-1-2	15.8	10.5	1.5	0.29	Flake
RB_411	1J-1-2	9.5	7.5	3.5	0.18	Flake
RB_412	1J-1-2	7.9	12	2.4	0.18	Flake
RB_413	1J-1-2	7.7	10.7	1.4	0.11	Preparation Flake
RB_414	1J-1-2	11.3	5.6	1	0.07	Preparation Flake
RB_415	1J-1-2	14.4	16.2	3.3	0.58	Preparation Flake
RB_416	1J-1-2	15.1	6.7	3.4	0.28	Debitage
RB_417	1J-1-2	22.2	8.5	2.9	0.55	Monoface
RB_418	1H-1-4	30.2	11.6	3.4	1.36	Blade
RB_419	1H-1-4	18.8	11.2	2.6	0.73	Blade
RB_420	1H-1-4	14.6	11.2	2.7	0.31	Blade
RB_421	1H-1-4	8	12.5	2.1	0.15	Flake
RB_422	1H-1-4	8.1	8.6	2.9	0.14	Flake
RB_423	1H-1-4	7.7	10.6	1.2	0.11	Preparation Flake
RB_424	1H-1-4	35	11.8	5.4	1.9	Expended Core
RB_425	8A-10-3	10.7	7.8	2.1	0.23	Blade
RB_426	8A-10-3	9.3	8	3.7	0.21	Debitage
RB_427	8A-9-3	13.7	9.1	2.6	0.28	Blade
RB_428	8A-9-3	17.7	12.2	2.4	0.48	Reworked Blade
RB_429	8A-2-3	20.2	22.6	3.7	1.12	Macroblade
RB_430	8A-2-3	18.7	10.5	2.4	0.43	Blade
RB_431	8A-2-2	26.6	12.1	4.2	1.16	Blade
RB_432	8A-2-2	14.6	7	1.5	1.04	Blade
RB_433	8A-2-2	12.7	10.7	2.6	0.16	Blade
RB_434	8A-2-2	16.6	10.8	2.6	0.47	Reworked Blade
RB_435	8A-2-2	11	8	3	0.23	Reworked Blade
RB_436	8A-2-2	8.8	12	3	0.22	Preparation Flake
RB_437	8A-2-2	10.7	12	2.5	0.22	Preparation Flake
RB_438	8A-2-2	7.5	5.2	3.3	0.17	Debitage
RB_439	8A-2-2	10	6.7	5.1	0.31	Debitage
RB_440	8A-2-2	10.4	8.1	3.8	0.26	Debitage
RB_441	8A-11-4	20.9	22.5	4.9	2.43	Macroblade
RB_442	8A-11-4	19.5	9.3	2.6	0.57	Blade
RB_443	8A-11-4	17.7	5.6	2	0.2	Blade
RB_444	8A-6-1	11.4	8.3	2	0.21	Blade
RB_445	8A-6-1	6.3	8.6	1.6	0.11	Blade
RB_446	8A-6-1	16.9	1.6	2.4	0.24	Blade
RB_447	8A-4-2	11.2	11.2	3.3	0.42	Blade
RB_448	8A-4-2	22.4	11.5	2.8	0.87	Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_449	8A-4-2	11.3	12.6	2.5	0.3	Reworked Blade
RB_450	8A-4-2	9.1	9.5	1.9	0.11	Preparation Flake
RB_451	8A-4-2	5.1	12.6	0.95	0.07	Preparation Flake
RB_452	8A-4-2	15.1	10.1	1.5	0.24	Preparation Flake
RB_453	8A-4-2	7.6	9.6	4.8	0.32	Debitage
RB_454	8A-4-2	11.6	7.5	3.4	0.19	Debitage
RB_455	8A-11-2	7.3	6.3	2	0.09	Blade
RB_456	8A-11-2	15.6	11.8	3.9	0.49	Blade
RB_457	8A-11-2	24.5	5.1	2.1	0.32	Blade
RB_458	8A-11-2	12.9	7.5	1.8	0.12	Blade
RB_459	8A-11-2	9.1	18.4	3.5	0.38	Flake
RB_460	8A-11-2	11.2	17.6	2.2	0.43	Flake
RB_461	8A-11-2	20.3	14.7	6.9	2.61	Expended Core
RB_462	8A-7-2	28	22.9	4	2.39	Macroblade
RB_463	8A-7-2	4.6	11.8	2.5	0.61	Blade
RB_464	8A-7-2	12.8	8.1	1.8	0.21	Blade
RB_465	8A-6-4	10.1	11.2	2.5	0.29	Reworked Blade
RB_466	8A-6-4	15.6	12.3	3.7	0.68	Reworked Blade
RB_467	8A-12-2	15.3	10.3	3	0.56	Blade
RB_468	8A-12-2	13.9	12.4	2.8	0.52	Blade
RB_469	8A-12-2	9	5.1	2	0.07	Blade
RB_470	8A-12-2	18	6.8	2.4	0.24	Flake
RB_471	8A-12-2	23.8	14.7	2.3	0.75	Flake
RB_472	8A-12-2	11.4	8.9	4.6	0.39	Debitage
RB_473	8A-12-2	13	9	4.1	0.32	Debitage
RB_474	8A-12-2	12.5	9.7	4.3	0.35	Debitage
RB_475	8A-3-1	12.7	9.6	2.6	0.39	Blade
RB_476	8A-3-1	27.7	10.8	2.4	0.91	Blade
RB_477	8A-3-1	11	7.9	3	0.25	Blade
RB_478	8A-11-3	28.1	26.1	5.4	2.52	Flake
RB_479	8A-11-3	8.9	10.9	1.3	0.18	Blade
RB_480	8A-11-3	12.9	5.8	1.2	0.1	Blade
RB_481	8A-9-1	11.4	8.1	3.1	0.25	Reworked Blade
RB_482	8A-2-1	23.7	9.3	2.8	0.75	Blade
RB_483	8A-2-1	7.7	10	1.8	0.16	Blade
RB_484	8A-2-1	6.4	7.6	1.6	0.07	Preparation Flake
RB_485	8A-2-1	12.9	10.9	1.25	0.2	Preparation Flake
RB_486	8A-4-1	18.1	13.4	3.1	1	Blade
RB_487	8A-4-1	15.1	10.9	1.6	0.35	Blade
RB_488	8A-4-1	13.1	7.1	2	0.16	Flake
RB_489	8A-4-1	16.4	13.1	4.1	0.75	Expended Core

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_490	8A-3-2	23.9	11	2.3	0.82	Blade
RB_491	8A-3-2	19.5	9.8	2.9	0.49	Blade
RB_492	8A-3-2	11.9	12.6	2.5	0.46	Blade
RB_493	8A-3-2	10.8	10.8	2.1	0.24	Flake
RB_494	8A-3-2	8.5	5.8	2	0.08	Preparation Flake
RB_495	8A-3-2	6.1	8	3.2	0.12	Debitage
RB_496	8A-6-2	25.4	13.2	2.2		Blade
RB_497	8A-6-2	12.5	13.5	2.23	0.36	Blade
RB_498	8A-6-2	13.2	9.2	2.4	0.29	Blade
RB_499	8A-6-2	35.4	16.5	8	4.92	Expended Core
RB_500	8A-6-3	17.4	11.3	2	0.58	Blade
RB_501	8A-7-5	10.8	13.3	1.5	0.24	Flake
RB_502	8A-12-4	19.5	14.5	3.8	1.1	Blade
RB_503	8A-12-4	12.2	14	3.9	0.52	Reworked Blade
RB_504	8A-12-4	18.7	29	5.9	2.8	Flake
RB_505	8A-7-1	8.9	11.9	1.9	0.15	Reworked Blade
RB_506	8A-10-1	11.4	12	2	0.31	Blade
RB_507	8A-3-3	11.1	10.9	2.5	0.39	Blade
RB_508	8A-3-3	15.6	19	3.2	0.62	Flake
RB_509	8A-3-3	14.5	15.5	4.4	0.78	Flake
RB_510	8A-3-3	27.7	6.3	5	0.8	Debitage
RB_511	8A-4-3	6.1	7.1	1.6	0.05	Preparation Flake
RB_512	8A-5-4	12.3	14.3	2.6	0.41	Flake
RB_513	8A-5-4	15.6	14.7	8.3	1.86	Expended Core
RB_514	8A-12-1	9.8	15	2.7	0.49	Blade
RB_515	8A-12-1	17.7	10.7	2.6	0.53	Blade
RB_516	8A-12-1	15.6	10.6	2.4	0.4	Blade
RB_517	8A-12-1	15.4	8.2	9.9	1.25	Expended Core
RB_518	8A-12-1	7.6	6.2	3.8	0.1	Debitage
RB_519	8A-4-4	19.8	15	3.1	0.69	Macroblade
RB_520	8A-4-4	14.5	12	3	0.63	Debitage
RB_521	8A-5-3	14	11.4	4.3	0.69	Reworked Blade
RB_522	8A-7-3	13	8.3	2	0.32	Blade
RB_523	8A-7-3	13.3	8.3	2	0.25	Blade
RB_524	8A-7-3	16.3	8	2.3	0.34	Reworked Blade
RB_525	8A-7-3	28.9	11.6	2.3	0.98	Reworked Blade
RB_526	8A-7-3	11.6	9.7	3	0.39	Reworked Blade
RB_527	8A-7-3	22.7	10.6	2.5	0.57	Reworked Blade
RB_528	8A-7-3	7.5	8.7	1.6	0.12	Preparation Flake
RB_529	8A-7-3	8.7	10.2	1.2	0.06	Preparation Flake
RB_530	8A-7-3	12.8	21.5	5.6	1.39	Expended Core

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_531	8A-5-1	25.3	9.4	2.1	0.74	Blade
RB_532	8A-5-1	9.2	7.3	1.5	0.12	Blade
RB_533	8A-5-1	9.6	14.2	2.7	0.3	Flake
RB_534	8A-13-1	5.1	11.1	2.7	0.12	Preparation Flake
RB_535	8A-14-2	19	19	5	0.94	Macroblade
RB_536	8A-9-3	22	12.6	3.1	0.52	Macroblade
RB_537	8A-9-3	23.2	10.5	1.9	0.51	Blade
RB_538	8A-9-3	17.4	14.4	2.4	0.91	Blade
RB_539	8A-9-3	7.3	5.2	3	0.08	Debitage
RB_540	8A-9-3	9.4	7.1	3.8	0.13	Debitage
RB_541	8A-5-2	22.4	12.4	3.1	0.86	Blade
RB_542	8A-5-2	14.2	12.8	3.2	0.52	Blade
RB_543	8A-5-2	15	9	2	0.31	Blade
RB_544	8A-5-2	13.3	7.8	1.8	0.23	Blade
RB_545	8A-5-2	14.4	7.6	2.2	0.2	Blade
RB_546	8A-5-2	12.2	5.8	2	0.13	Blade
RB_547	8A-5-2	21.3	8.5	3.7	0.55	Monoface
RB_548	8A-5-2	17.8	10.3	2.9	0.63	Reworked Blade
RB_549	8A-5-2	11.2	10.8	3.3	0.28	Reworked Blade
RB_550	8A-5-2	11.8	10.4	2.8	0.31	Reworked Blade
RB_551	8A-5-2	9.6	10.5	3	0.24	Reworked Blade
RB_552	8A-5-2	10.9	12.2	3	0.43	Reworked Blade
RB_553	8A-5-2	8.7	8.9	1.3	0.1	Preparation Flake
RB_554	8A-5-2	12.9	9.1	1.6	0.2	Preparation Flake
RB_555	8A-5-2	6.4	6.1	2	0.05	Preparation Flake
RB_556	8A-5-2	8.2	9.5	2.6	0.13	Preparation Flake
RB_557	8A-5-2	7	8.1	1.1	0.05	Preparation Flake
RB_558	8A-5-2	8.4	12.5	3	0.21	Preparation Flake
RB_559	8A-5-2	8.3	8.2	3.6	0.17	Debitage
RB_560	8A-5-2	11	9.3	4.4	0.38	Debitage
RB_561	11A-5-3	16.5	14.6	1.9	0.57	Blade
RB_562	11A-5-3	30	10.5	2.8	1.02	Blade
RB_563	11A-5-4	18.1	19.4	2.9	0.89	Macroblade
RB_564	11A-5-4	30.6	13.1	3.1	1.38	Blade
RB_565	11A-5-4	29.9	11.9	2.2	0.84	Blade
RB_566	11A-5-4	19.4	9.9	2.4	0.52	Blade
RB_567	11A-5-4	23.7	7.9	2.5	0.69	Blade
RB_568	11A-5-4	16.9	9	1.8	0.32	Blade
RB_569	11A-5-4	13.4	8.1	2.5	0.21	Blade
RB_570	11A-5-4	17.3	8.2	2.3	0.33	Reworked Blade
RB_571	11A-5-4	14.2	11	2.9	0.34	Reworked Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_572	11A-5-4	14.9	8.7	2.7	0.28	Debitage
RB_573	11A-5-4	11.5	7.2	2.9	0.16	Debitage
RB_574	11A-5-4	15.5	13.9	6.3	1.16	Debitage
RB_575	11A-5-2	23.8	13.4	3	1.03	Macroblade
RB_576	11A-5-2	15.1	9.1	2.2	0.39	Blade
RB_577	11A-5-2	7.8	13.7	2.4	0.2	Flake
RB_578	11A-5-2	13.2	9.4	0.8	0.11	Preparation Flake
RB_579	11A-5-2	32.1	15.7	7	2.9	Expended Core
RB_580	11A-5-1	28.8	13	4.6	2.1	Macroblade
RB_581	11A-5-1	20.8	12.8	3.1	0.76	Blade
RB_582	11A-5-1	15.3	8.3	1.6	0.21	Blade
RB_583	11A-5-1	8.3	11.4	1.8	0.14	Preparation Flake
RB_584	11A-5-1	31.8	13.4	8.5	3.48	Expended Core
RB_585	11A-4-4	12.1	12.8	1.7	0.39	Blade
RB_586	11A-3-1	25.8	10.7	2	0.75	Blade
RB_587	11A-3-1	14.7	9.4	3.5	47	Reworked Blade
RB_588	11A-3-1	12.7	11.9	2.9	0.38	Flake
RB_589	11A-3-1	17.7	27	5.7	1.98	Flake
RB_590	11A-3-1	22.6	9.7	5.7	0.96	Preparation Flake
RB_591	11A-5-6	48.3	14.3	3.5	2.65	Blade
RB_592	11A-5-6	29.7	9.7	2.9	0.88	Blade
RB_593	11A-5-6	12.1	13.5	4	0.44	Flake
RB_594	11A-5-5	32.9	13.6	3.5	1.85	Blade
RB_595	11A-5-5	24	10.8	2.4	0.91	Blade
RB_596	11A-5-5	17.6	8.6	2.9	0.46	Blade
RB_597	11A-5-5	17	11.3	2.8	0.7	Blade
RB_598	11A-5-5	19.6	37.5	2.9	2.98	Flake
RB_599	11A-5-5	16.7	10.2	2.8	0.44	Flake
RB_600	11A-5-5	28.5	20.2	4.1	1.46	Flake
RB_601	11A-2-1	28.6	11.7	3	0.98	Blade
RB_602	11A-2-1	17.2	11.3	1.9	0.54	Blade
RB_603	11A-2-1	19.3	26	4.4	2.66	Flake
RB_604	11A-2-1	15.5	16.9	4.8	1.26	Flake
RB_605	11A-1-2	17	15.5	3.8	0.91	Macroblade
RB_606	11A-1-2	13.3	9.4	1.7	0.18	Blade
RB_607	11A-1-2	15.2	13.8	3.2	0.61	Flake
RB_608	8A-1-4	35.3	11	2.2	1.07	Blade
RB_609	8A-1-4	16.5	9.5	3.3	0.41	Blade
RB_610	7B-1-2	11.2	16.6	3.8	0.8	Macroblade
RB_611	7B-1-2	10.9	18.5	3.3	0.62	Macroblade
RB_612	7B-1-2	18.4	12.7	2.7	0.87	Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_613	7B-1-2	9.6	12.7	1.8	0.25	Blade
RB_614	7B-1-2	15.8	10.4	2.5	0.47	Blade
RB_615	7B-1-2	8.1	11.3	2.2	0.15	Preparation Flake
RB_616	7B-1-2	7	4.2	4.6	0.14	Debitage
RB_617	7B-1-2	5.1	10.7	4.1	0.27	Debitage
RB_618	7B-1-2	10.5	5.3	3.5	0.28	Debitage
RB_619	7B-1-2	10.1	4.2	2.4	0.07	Debitage
RB_620	9A-1-3	35.7	7.2	1.8	0.6	Blade
RB_621	9A-1-3	15.4	8	2.6	0.31	Blade
RB_622	8A-1-2	11.7	15	2.2	0.35	Macroblade
RB_623	8A-1-2	12.4	8.8	3	0.4	Macroblade
RB_624	8A-1-2	12	14.4	2.3	0.22	Preparation Flake
RB_625	8A-1-2	7.6	10	1.9	0.13	Preparation Flake
RB_626	7A-1-4	15.2	6.7	3	0.28	Flake
RB_627	6C-1-2	12.7	4.6	2.4	0.1	Debitage
RB_628	11B-1-2	9.5	8.4	1.6	0.16	Blade
RB_629	11B-1-2	13.8	11.2	2.5	0.41	Blade
RB_630	12C-1-3	16.1	9.6	2.2	0.34	Blade
RB_631	12C-1-3	15.2	9.2	2.5	0.29	Blade
RB_632	12C-1-3	14.2	19.5	4.2	0.99	Debitage
RB_633	6E-1-4	31.6	19.4	4.1	2.8	Macroblade
RB_634	6E-1-4	14.3	10	2.1	0.37	Blade
RB_635	6E-1-4	16.8	14.7	5.7	0.99	Flake
RB_636	6E-1-4	8.8	6.4	1.1	0.07	Preparation Flake
RB_637	6E-1-4	12.2	6.3	0.6	0.07	Preparation Flake
RB_638	7B-1-6	14.6	9.7	3.6	0.46	Debitage
RB_639	7B-1-6	9.3	3.6	2	0.07	Debitage
RB_640	12C-1-2	19.6	12.5	3.6	0.65	Macroblade
RB_641	12C-1-2	9.9	7	2.2	0.11	Blade
RB_642	12C-1-2	9.6	8.1	3.3	0.28	Expended Core
RB_643	12A-1-1	11.9	9.9	2.5	0.29	Flake
RB_644	12A-1-1	8.5	9.2	1.4	0.11	Preparation Flake
RB_645	12A-1-1	10.3	6.5	5.4	0.35	Debitage
RB_646	12A-1-1	16	7.2	3.2	0.24	Debitage
RB_647	6E-1-3	17.2	19.6	5.3	1.24	Macroblade
RB_648	6E-1-3	13.3	12.2	3	0.42	Blade
RB_649	6E-1-3	10.2	12	2.2	0.3	Blade
RB_650	6E-1-3	28	8.3	2.3	0.56	Blade
RB_651	6E-1-3	11.6	5.3	1.5	0.13	Blade
RB_652	6E-1-3	14.3	8.5	2.2	0.24	Blade
RB_653	6E-1-3	7.3	8.6	1.7	0.12	Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_654	6E-1-3	14.6	11.7	2.3	0.42	Blade
RB_655	6E-1-3	16.6	14.3	5	1.02	Debitage
RB_656	6E-1-3	14	12.4	5.2	0.93	Debitage
RB_657	6E-1-3	16.8	10	4.5	0.62	Debitage
RB_658	10A-1-3	21.6	13.3	1.6	0.42	Macroblade
RB_659	7A-1-2	9.2	7.3	1.7	0.1	Blade
RB_660	7A-1-2	18.6	13.3	3.5	1.01	Blade
RB_661	7A-1-2	13.7	9.7	1.8	0.21	Blade
RB_662	7A-1-2	17.9	11.1	2.8	0.43	Flake
RB_663	7A-1-2	13.2	9.6	3.2	0.33	Preparation Flake
RB_664	7A-1-2	8.5	6.2	2.4	0.1	Debitage
RB_665	7A-1-2	5.2	7.7	2.3	0.08	Blade
RB_666	7A-1-2	12.8	5.6	3.5	0.22	Debitage
RB_667	6E-1-1	9.3	8.1	2.9	0.19	Blade
RB_668	6E-1-1	13.9	7.3	2.7	0.23	Reworked Blade
RB_669	6E-1-1	15.5	9.4	7.6	0.94	Expended Core
RB_670	6E-1-1	8.5	5.3	2.6	0.09	Debitage
RB_671	6B-1-1	17.4	11.4	2.4	0.5	Flake
RB_672	6B-1-1	6.9	9.8	3.4	0.18	Debitage
RB_673	6A-4-3	19.8	15.7	3.5	1.16	Flake
RB_674	6A-4-3	9.8	10	3	0.23	Flake
RB_675	6A-4-3	17.1	13	1.7	0.31	Flake
RB_676	11B-1-10	39.3	16	5.2	3.58	Macroblade
RB_677	11B-1-10	26.4	17.7	3.2	1.49	Macroblade
RB_678	11B-1-10	9.5	7.8	2.5	0.22	Blade
RB_679	11B-1-10	16.2	12	2.7	0.67	Blade
RB_680	11B-1-10	7.8	11.8	2.8	0.25	Blade
RB_681	11B-1-10	13.4	8.8	2.1	0.34	Blade
RB_682	11B-1-10	9.7	7.7	2.3	0.18	Blade
RB_683	11B-1-10	5.9	9.1	3	0.11	Blade
RB_684	11B-1-10	9.3	10.2	1.4	0.14	Blade
RB_685	11B-1-10	14.3	9.6	2	0.38	Blade
RB_686	11B-1-10	19.4	12.9	3.4	0.72	Blade
RB_687	11B-1-10	8.6	4.3	1.6	0.08	Blade
RB_688	11B-1-10	10.7	7.7	1.7	0.16	Blade
RB_689	11B-1-10	16.7	11.1	3.2	0.65	Monoface
RB_690	11B-1-10	14.1	12.2	5.2	0.8	Point
RB_691	11B-1-10	20.2	10.3	5.15	0.77	Flake
RB_692	11B-1-10	12.2	7.6	4.1	0.28	Debitage
RB_693	11B-1-10	14.6	11.1	4	0.4	Debitage
RB_694	11B-1-10	7	7.7	3.2	0.14	Debitage

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_695	11B-1-10	15.1	5.1	3.5	0.26	Debitage
RB_696	11B-1-10	14.5	4.8	1.5	0.1	Debitage
RB_697	11B-1-10	9.6	9.2	3.5	0.23	Debitage
RB_698	6A-6-9	14.9	8.5	2.2	0.24	Blade
RB_699	6A-6-9	23.4	9.4	3.2	0.53	Flake
RB_700	6A-6-9	9.6	11.9	1.6	0.13	Preparation Flake
RB_701	6A-6-9	13.1	10.5	1.6	0.13	Preparation Flake
RB_702	6A-5-3	10.9	8.2	3.3	0.29	Reworked Blade
RB_703	12C-1-1	24.6	11.9	2.42	0.76	Blade
RB_704	12C-1-1	15.5	7.5	1.7	0.24	Blade
RB_705	12C-1-1	14.6	9.2	2.3	0.34	Blade
RB_706	12C-1-1	16.2	11.2	3.1	0.41	Blade
RB_707	12C-1-1	112.8	13.8	2.6	0.51	Blade
RB_708	12C-1-1	16.6	12.5	2.6	0.74	Blade
RB_709	12C-1-1	25.9	3.6	3.2	0.37	Blade
RB_710	12C-1-1	15.1	4	1.9	0.12	Blade
RB_711	12C-1-1	21.9	11.9	4.1	0.86	Preparation Flake
RB_712	12C-1-1	8.7	15.5	3.7	0.53	Preparation Flake
RB_713	12C-1-1	10.5	13.1	4.2	0.41	Preparation Flake
RB_714	12C-1-1	10.8	12.3	2.4	0.27	Preparation Flake
RB_715	12C-1-1	16.3	10.3	2.6	0.31	Preparation Flake
RB_716	12C-1-1	6.3	7.4	1.7	0.08	Preparation Flake
RB_717	12C-1-1	10.5	14.1	2.5	0.29	Flake
RB_718	12C-1-1	14.3	21.4	2.2	0.7	Flake
RB_719	12C-1-1	16.4	4.6	2.2	0.12	Debitage
RB_720	12C-1-1	11.4	17.8	3	0.56	Debitage
RB_721	12C-1-1	16.8	21	6.8	0.98	Debitage
RB_722	8A-1-3	19.6	8.3	2.1	0.45	Blade
RB_723	6A-5-2	10.8	8	1	0.13	Blade
RB_724	6A-5-2	11.2	9.4	2.7	0.24	Reworked Blade
RB_725	6A-5-2	8.1	7	4.2	0.11	Debitage
RB_726	6C-1-4	18.6	12.8	4.2	0.96	Blade
RB_727	6C-1-4	21.7	9.3	2.7	0.69	Blade
RB_728	6C-1-4	9	11.1	3.4	0.33	Blade
RB_729	6C-1-4	7.4	5.9	1.1	0.06	Preparation Flake
RB_730	6A-3-2	12.3	16.5	3.4	0.68	Flake
RB_731	6B-2-1	21.5	8.7	3.2	0.51	Blade
RB_732	6B-2-1	20	9.6	2.2	0.58	Blade
RB_733	6B-2-1	15.6	11.5	2.6	0.57	Blade
RB_734	6B-2-1	20.3	9.6	2.1	0.6	Blade
RB_735	6B-2-1	6.5	9.1	5	0.35	Debitage

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_736	6B-2-1	5.8	11.8	1.9	0.11	Blade
RB_737	7B-1-3	22.4	18.5	3.9	1.59	Macroblade
RB_738	7B-1-3	12.5	4.4	1.8	0.11	Blade
RB_739	7B-1-3	13.9	8	1.9	0.18	Blade
RB_740	7B-1-3	18.5	12	3.2	0.58	Flake
RB_741	7B-1-3	9.9	5.9	1.8	0.1	Preparation Flake
RB_742	7B-1-3	8.6	9.9	0.9	0.09	Preparation Flake
RB_743	7B-1-3	7.3	9.5	2.3	0.11	Preparation Flake
RB_744	7B-1-3	26.1	9.2	3.9	0.66	Debitage
RB_745	7B-1-3	15.5	12.2	4.5	0.67	Debitage
RB_746	7B-1-3	15.5	6.5	3.8	0.33	Debitage
RB_747	13A-1-2	8.9	8.4	1.7	0.12	Blade
RB_748	13A-1-2	12.2	6.7	1.9	0.2	Blade
RB_749	13A-1-2	16.5	7.7	2.8	0.25	Flake
RB_750	13A-1-2	13.9	8.7	2.4	0.21	Flake
RB_751	13A-1-2	11.4	8.1	1.4	0.11	Preparation Flake
RB_752	13A-1-2	8.4	9	1.1	0.09	Preparation Flake
RB_753	13A-1-2	9.5	4.5	4.7	0.17	Debitage
RB_754	13A-1-2	11.5	6.8	2.8	0.24	Debitage
RB_755	11B-1-9	13.8	8.6	2.2	0.3	Blade
RB_756	11B-1-9	9.3	8.6	1.8	0.16	Blade
RB_757	11B-1-9	12.5	10.8	3	0.3	Flake
RB_758	11B-1-9	10.3	13.3	6.5	0.75	Expended Core
RB_759	11B-1-5	16	10.1	1.9	0.28	Flake
RB_760	11B-1-6	15.2	11.1	1.9	0.47	Blade
RB_761	6A-6-2	19.7	7.9	3.1	0.55	Blade
RB_762	6A-3-5	18.9	11.9	1.8	0.48	Blade
RB_763	10A-1-1	14.4	8.9	2.5	0.32	Blade
RB_764	10A-1-1	11.1	4.3	2.1	0.1	Blade
RB_765	10A-1-1	19.8	12	3.3	0.7	Reworked Blade
RB_766	10A-1-1	13.9	10.2	2.7	0.24	Flake
RB_767	10A-1-1	9.1	5.8	1	0.07	Preparation Flake
RB_768	11B-1-12	16.6	6.2	2.7	0.36	Awl
RB_769	11B-1-12	8	7	1.6	0.09	Blade
RB_770	11B-1-12	10.5	8.6	1.7	0.14	Blade
RB_771	11B-1-12	14.7	9.2	3.8	0.36	Flake
RB_772	11B-1-12	9.8	9.8	2	0.26	Flake
RB_773	11B-1-8	20	9	2.3	0.38	Flake
RB_774	6A-6-6	36.4	9.4	2.6		Blade
RB_775	6A-6-6	9.7	16.7	3.1	0.48	Flake
RB_776	6A-4-5	17.5	10.6	2.5	0.29	Flake

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_777	6A-3-7	16.8	8.1	2	0.27	Flake
RB_778	13A-1-1	13.9	9	2.1	0.27	Blade
RB_779	13A-1-1	10.2	11.1	1.48	0.2	Blade
RB_780	13A-1-1	13.1	8.9	1.6	0.24	Blade
RB_781	13A-1-1	8	8.9	1.4	0.09	Blade
RB_782	13A-1-1	11.4	12	4.4	0.38	Blade
RB_783	13A-1-1	14.7	9.3	2	0.18	Flake
RB_784	13A-1-1	9.8	7.8	2.3	0.11	Preparation Flake
RB_785	13A-1-1	9.8	8.1	2.1	0.11	Preparation Flake
RB_786	13A-1-1	10.6	11.6	2.3	0.18	Preparation Flake
RB_787	13A-1-1	11.2	9	2.6	0.22	Preparation Flake
RB_788	13A-1-1	6.2	9.6	2	0.11	Preparation Flake
RB_789	13A-1-1	9.7	9.4	3.5	0.35	Debitage
RB_790	13A-1-1	13.2	7.8	2.7	0.33	Debitage
RB_791	7A-1-1	9.8	6.9	1	0.05	Preparation Flake
RB_792	11B-1-2	10	11.4	1.1	0.17	Preparation Flake
RB_793	11B-1-2	8.1	4	1.9	0.05	Preparation Flake
RB_794	11B-1-2	5.1	15.1	4.6	0.31	Expended Core
RB_795	6C-1-1	15.2	10.3	2.5	0.41	Blade
RB_796	6C-1-1	13.2	9.4	1.8	0.3	Blade
RB_797	6C-1-1	8	4.1	1.5	0.03	Preparation Flake
RB_798	6E-1-2	11.3	8.9	1.3	0.17	Blade
RB_799	6E-1-2	11.1	5	1.1	0.07	Blade
RB_800	6E-1-2	14.1	6.3	1.4	0.14	Blade
RB_801	6E-1-2	9.1	6	1.5	0.07	Blade
RB_802	6E-1-2	12	6.4	1.3	0.09	Blade
RB_803	6E-1-2	14.6	9.5	3.1	0.29	Flake
RB_804	6E-1-2	6	10.3	3	0.12	Reworked Blade
RB_805	6E-1-2	9	8.3	2.1	0.18	Reworked Blade
RB_806	6E-1-2	9.8	7.7	2.9	0.18	Reworked Blade
RB_807	6E-1-2	9.6	10	2.1	0.19	Reworked Blade
RB_808	6E-1-2	12	7.9	2.3	0.25	Modified Flake
RB_809	6E-1-2	17.4	6.4	3	0.28	Modified Flake
RB_810	6E-1-2	9.2	5.7	3.6	0.17	Expended Core
RB_811	6E-1-2	8.8	8.3	4.6	0.3	Debitage
RB_812	6E-1-2	8.3	4.6	2.9	0.11	Debitage
RB_813	12B-1-2	14.8	14.5	3.3	0.56	Macroblade
RB_814	12B-1-2	12.5	13.3	2.1	0.34	Macroblade
RB_815	12B-1-2	19.3	8	2.6	0.39	Blade
RB_816	12B-1-2	17.6	11	2.4	0.59	Blade
RB_817	12B-1-2	9.3	11.2	2.5	0.19	Preparation Flake

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_818	12B-1-2	10.9	10.5	1.5	0.13	Preparation Flake
RB_819	6A-4-2	25.3	12.9	4.7	0.98	Point
RB_820	6A-4-2	21.7	7.8	7.6	1.2	Expended Core
RB_821	6A-4-2	7	7.6	1.6	0.05	Preparation Flake
RB_822	6A-4-2	10	7.5	4	0.24	Debitage
RB_823	7B-1-4	8.1	7.5	2.1	0.13	Blade
RB_824	7B-1-4	10.6	6.5	2.2	0.13	Blade
RB_825	7B-1-4	10.4	10.3	2	0.16	Reworked Blade
RB_826	7B-1-4	7.7	6	0.9	0.05	Preparation Flake
RB_827	6A-6-1	14.9	11.8	4.1	0.66	Biface
RB_828	9A-1-4	6.9	4	1.2	0	Debitage
RB_829	8A-1-1	21.1	12	2.2	0.81	Blade
RB_830	6C-1-11	8.2	16.9	2.8	0.44	Blade
RB_831	11A-1-3	8.8	7	1.8	0.11	Preparation Flake
RB_832	6A-6-4	7.5	22.8	8.2	1.43	Expended Core
RB_833	6A-6-4	7.3	16.6	2.2	0.18	Flake
RB_834	6A-5-1	11	3.5	1.5	0.06	Preparation Flake
RB_835	6A-5-1	10.8	13.9	3.5	0.43	Blade
RB_836	6A-5-1	19.5	9.9	2.7	0.69	Blade
RB_837	9A-1-6	8	11.6	1.6	0.1	Preparation Flake
RB_838	9A-1-6	19.7	15.7	2.6	0.86	Flake
RB_839	11A-1-1	14	10.2	2.6	0.26	Flake
RB_840	11A-1-1	16.1	10.6	14.9	0.68	Monoface
RB_841	12B-1-1	10.2	17.9	6.1	0.9	Debitage
RB_842	6C-1-3	12	6.3	3.2	0.31	Awl
RB_843	6C-1-3	13.9	17.5	2.9	0.93	Macroblade
RB_844	6C-1-3	21.2	15.6	2.8	0.69	Macroblade
RB_845	6C-1-3	16.7	10.4	2	0.3	Blade
RB_846	6C-1-3	21.4	13.6	3.2	1.1	Blade
RB_847	6C-1-3	9.9	12.6	2.7	0.23	Blade
RB_848	6C-1-3	12.2	9.6	2.3	0.39	Blade
RB_849	6C-1-3	17.6	7.2	2.4	0.44	Blade
RB_850	6C-1-3	10.6	10.8	2.6	0.32	Blade
RB_851	6C-1-3	5.5	7.1	1.7	0.08	Blade
RB_852	6C-1-3	15.8	8.9	2.5	0.34	Blade
RB_853	6C-1-3	21.8	9	2.7	0.6	Blade
RB_854	6C-1-3	16.2	3.2	1.4	0.11	Blade
RB_855	6C-1-3	26.3	9.3	2	0.64	Blade
RB_856	6C-1-3	8.7	7	2.5	0.13	Reworked Blade
RB_857	6C-1-3	18.2	13.7	3.2	0.55	Reworked Blade
RB_858	6C-1-3	8.2	9.4	2.5	0.2	Reworked Blade

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_859	6C-1-3	15.3	8.6	2.4	0.28	Reworked Blade
RB_860	6C-1-3	11.6	4.5	1.7	0.17	Flake
RB_861	6C-1-3	14	15.4	3.8	0.64	Flake
RB_862	6C-1-3	8	6.7	1.8	0.11	Preparation Flake
RB_863	10A-1-2	15.4	6.5	3	0.28	Blade
RB_864	10A-1-2	15.2	13.2	2.7	0.43	Flake
RB_865	10A-1-2	10.5	5.7	1.5	0.08	Preparation Flake
RB_866	10A-1-2	9.5	7.5	2	0.11	Preparation Flake
RB_867	10A-1-2	16.4	12	4.6	0.61	Modified Flake
RB_868	10A-1-2	15.6	9.3	3.7	0.43	Expended Core
RB_869	10A-1-2	20.4	13.7	4.1	1.04	Expended Core
RB_870	10A-1-2	24.5	14.8	5.9	1.91	Flake
RB_871	6C-1-6	10.6	19.5	3.5	0.58	Macroblade
RB_872	6C-1-6	30.4	13.1	4.2	1.81	Blade
RB_873	6C-1-6	20.6	8.9	2.4	0.54	Blade
RB_874	6C-1-6	23.4	9.2	2.4	0.76	Blade
RB_875	7A-1-3	12.5	8.8	2.3	0.31	Blade
RB_876	7A-1-3	10.1	6.3	1.7	0.07	Preparation Flake
RB_877	7A-1-3	4.2	12.6	4.8	0.17	Debitage
RB_878	6A-8-6	41.2	17.8	3.1	2.97	Macroblade
RB_879	6A-8-6	15.8	10.6	3.3	0.49	Blade
RB_880	6A-8-6	11.2	7.5	1.9	0.2	Blade
RB_881	6C-1-5	16.7	18	3.7	1.04	Macroblade
RB_882	6C-1-5	22.2	7.3	2.6	0.4	Blade
RB_883	6C-1-5	14.3	9.6	2.2	0.44	Blade
RB_884	6C-1-5	7.5	10	1.4	0.11	Blade
RB_885	6C-1-5	13.7	7.4	2.3	0.31	Blade
RB_886	6C-1-5	18.7	6.2	2.4	0.22	Blade
RB_887	6C-1-5	13.8	11	2.5	0.29	Reworked Blade
RB_888	6C-1-5	12.3	10.4	2.7	0.31	Reworked Blade
RB_889	6C-1-5	13	11.8	2.5	0.43	Reworked Blade
RB_890	6C-1-5	21.3	19.6	5.9	2.54	Expended Core
RB_891	1A-1-1	17.2	15	2.1	0.38	Macroblade
RB_892	1A-1-1	26.5	9.5	2.4	0.7	Blade
RB_893	1A-1-1	16.3	10.7	3.1	0.4	Blade
RB_894	1A-1-1	15.7	4.2	2.6	0.15	Blade
RB_895	1A-1-1	11.6	13.6	2	0.28	Flake
RB_896	1A-1-1	11.7	16.5	2.8	0.45	Flake
RB_897	1A-1-1	13.4	11.6	2.1	0.33	Flake
RB_898	1A-1-1	9.4	9.9	2.1	0.16	Preparation Flake
RB_899	1A-1-1	9.8	5.8	1.9	0.09	Preparation Flake

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_900	1A-1-1	15.4	7.9	3.2	0.28	Debitage
RB_901	1A-1-1	19.7	15.1	4.9	1.34	Expended Core
RB_902	1A-4-1	11.1	9.4	2.4	0.29	Blade
RB_903	1A-4-1	32.8	8.9	2.2	0.9	Blade
RB_904	1A-4-1	19.8	10.6	2.6	0.67	Blade
RB_905	1A-4-1	19	9.6	2.3	0.58	Blade
RB_906	1A-4-1	10.2	9.4	2.4	0.2	Blade
RB_907	1A-4-1	8.7	8.8	2.3	0.12	Preparation Flake
RB_908	1A-4-1	18.8	9.9	4.3	0.48	Debitage
RB_909	3A-1-2	28.2	7.3	3	0.66	Blade
RB_910	3A-1-2	10	8.2	2.5	0.24	Blade
RB_911	3A-1-2	26.6	10.9	2	0.75	Blade
RB_912	3A-1-2	10.5	7.6	1.2	0.07	Preparation Flake
RB_913	3A-1-2	13	22.9	5.1	1.43	Expended Core
RB_914	3A-1-2	11.4	13.2	4.1	0.53	Expended Core
RB_915	3A-1-2	12.4	5.8	4.6	0.26	Debitage
RB_916	3A-1, 2, 3, 4-3	37.2	13.6	3.8	2.19	Blade
RB_917	3A-1, 2, 3, 4-3	30.5	9.6	2.8	1.24	Blade
RB_918	3A-1, 2, 3, 4-3	11.4	8.2	2.4	0.27	Blade
RB_919	3A-1, 2, 3, 4-3	8.6	11.5	1.6	0.16	Blade
RB_920	3A-1, 2, 3, 4-3	19.1	12.3	2.2	0.69	Blade
RB_921	3A-1, 2, 3, 4-3	18.5	16.1	5.6	1.53	Monoface
RB_922	3A-1, 2, 3, 4-3	18.6	17	3.6	0.6	Flake
RB_923	3A-1, 2, 3, 4-3	17.2	10.6	1.7	0.29	Flake
RB_924	3A-1, 2, 3, 4-3	9.3	8.3	1.5	0.12	Preparation Flake
RB_925	3A-1, 2, 3, 4-3	9	8.9	1.7	0.13	Preparation Flake
RB_926	3A-1, 2, 3, 4-3	13.8	9.3	3.7	0.48	Debitage
RB_927	3A-1, 2, 3, 4-3	9.5	7	2.9	0.15	Debitage
RB_928	3A-2-1	19.4	13.2	4.4	1.17	Macroblade
RB_929	3A-2-1	13.8	10.1	3.2	0.37	Blade
RB_930	3A-2-1	15.1	8.3	2.2	0.38	Blade
RB_931	3A-2-1	13.9	10.1	2.7	0.25	Flake
RB_932	3A-2-1	10	10.6	2.1	0.22	Reworked Blade
RB_933	3A-2-1	7.8	8.9	1.3	0.09	Preparation Flake

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_934	3A-2-1	10.1	10.7	3.8	0.25	Expended Core
RB_935	2A-0-0	9.7	13.2	3.4	0.47	Macroblade
RB_936	2A-0-0	22.1	22.1	4.6	2.43	Macroblade
RB_937	2A-0-0	10.5	7.7	2.4	0.22	Blade
RB_938	2A-0-0	16.7	12.7	2.7	0.68	Blade
RB_939	2A-0-0	13.9	5.7	1.4	0.11	Blade
RB_940	2A-0-0	10.8	8.8	2.4	0.25	Blade
RB_941	2A-0-0	7	16.7	4.6	0.55	Expended Core
RB_942	1A-0-0	41.2	20.8	5	3.68	Macroblade
RB_943	1A-0-0	21.6	16.7	2.4	1.09	Macroblade
RB_944	1A-0-0	42.8	13.8	3.9	2.61	Blade
RB_945	1A-0-0	22.4	11.1	2.9	0.83	Blade
RB_946	1A-0-0	30.1	10.9	2.4	0.95	Blade
RB_947	1A-0-0	24.7	9.4	2.4	0.72	Blade
RB_948	1A-0-0	11.8	9.7	3.1	0.33	Blade
RB_949	1A-0-0	9.8	8.6	1.7	0.21	Blade
RB_950	1A-0-0	11.5	8.4	2.3	0.3	Blade
RB_951	1A-0-0	11.8	16.3	4.3	0.68	Flake
RB_952	1A-0-0	13.4	18.3	5.1	1.04	Flake
RB_953	1A-0-0	24.5	17.7	5.9	2.47	Monoface
RB_954	1A-0-0	11.1	8.5	1.6	0.12	Preparation Flake
RB_955	1A-0-0	15.2	20.8	6.1	1.64	Debitage
RB_956	1A-0-0	15.3	12	5.6	0.71	Debitage
RB_957	1A-0-0	13.3	29.1	14.2	3.68	Expended Core
RB_958	1E-1-1	29.9	10.6	2.5	1.05	Blade
RB_959	1E-1-1	11.5	8	1.8	0.2	Blade
RB_960	1E-1-1	8.7	9.7	1.7	0.19	Blade
RB_961	1E-1-1	12.7	10.8	2	0.36	Flake
RB_962	1E-1-1	11.8	15.3	2.6	0.46	Flake
RB_963	1E-1-1	11.5	11	3.7	0.4	Reworked Blade
RB_964	1E-1-1	17	17.6	5.6	1.58	Monoface
RB_965	1E-1-1	23.8	17.9	3.6	1.46	Point
RB_966	1E-1-1	18.1	10.3	5	0.97	Expended Core
RB_967	3A-2-2	27.3	16.2	4	1.63	Macroblade
RB_968	3A-2-2	10.7	7.5	1.4	0.1	Blade
RB_969	3A-2-2	15.3	8.3	1.8	0.21	Blade
RB_970	3A-2-2	15.1	10	2.6	0.25	Blade
RB_971	3A-2-2	19.9	8.3	2	0.39	Blade
RB_972	3A-2-2	13.2	3.7	2.7	0.13	Blade
RB_973	3A-2-2	13	13.7	2.7	0.38	Flake
RB_974	3A-2-2	14.1	26.6	5.6	1.88	Debitage

Table C.2 (Continued)

ID#	Lot	Length	Width	Thickness	Weight	Type
RB_975	1A-1,2,3,4,5-2	14	7.4	2.5	0.23	Blade
RB_976	1A-2-2	20.5	15	2.3	0.98	Macroblade
RB_977	1A-2-2	16.2	10.1	2.3	0.49	Blade
RB_978	1A-2-2	14.8	8.9	2.6	0.37	Blade
RB_979	1A-2-2	18.5	13.3	1.8	0.29	Flake
RB_980	1A-2-1	39.9	9.5	9.8	1.13	Blade
RB_981	1A-2-1	14.3	9.6	2.9	0.41	Blade
RB_982	1A-2-1	13.5	8.9	2.2	0.19	Flake
RB_983	1A-2-1	19.4	10.1	3.2	0.58	Flake
RB_984	1A-1-2	8.9	7.8	1.6	0.14	Blade
RB_985	1A-1-2	9.5	9.3	2.4	0.13	Blade
RB_986	1A-1-2	15.4	10.6	2.7	0.37	Flake
RB_987	1A-1-2	13.4	8.7	2.7	0.18	Flake
RB_988	1A-1-2	10.9	14.8	6	0.78	Expended Core
RB_989	1A-3-2	15.5	9.8	2.6	0.37	Blade
RB_990	1A-3-2	10.2	10.7	2.2	0.14	Reworked Blade
RB_991	1A-3-2	12.5	13.5	5.4	0.64	Debitage
RB_992	1C-1-2	17.1	9.4	2.5	0.47	Blade
RB_993	1C-1-2	16.4	12	2.8	0.74	Blade
RB_994	1C-1-3	9.3	5.3	1.2	0.06	Preparation Flake
RB_995	1A-5-1	16.3	9.5	1.9	0.44	Blade
RB_996	1A-5-2	7.7	7.2	1.4	0.05	Preparation Flake
RB_997	1A-5-2	8.7	7.6	2.1	0.1	Preparation Flake
RB_998	3A-2-3	36.7	30.4	7.9	8.29	Flake
RB_999	1E-1-2	11.9	3.5	2.2	0.12	Blade
RB_1000	1E-1-2	9.9	6.7	1.6	0.08	Blade
RB_1001	1E-1-2	9.7	5.9	1.4	0.07	Preparation Flake
RB_1002	1E-1-2	8.8	6.2	1.6	0.07	Preparation Flake
RB_1003	1E-1-2	14.4	12.5	2.9	0.51	Flake
RB_1004	1E-1-2	9.3	4.1	3.5	0.16	Debitage
RB_1005	3A-3-2	15.1	9.6	4.8	0.64	Reworked Blade
RB_1006	3A-3-1	18.9	4.7	2.5	0.26	Blade
RB_1007	3A-0-0	9.1	7.6	2.1	0.11	Blade
RB_1008	3A-1-1	13.4	13.3	3.8	0.59	Blade
RB_1009	3A-4-2	9.5	7.6	2.5	0.17	Reworked Blade
RB_1010	3A-4-1	23	13.1	3.2	0.87	Macroblade
RB_1011	3A-4-1	19.5	9.8	2.6	0.48	Blade
RB_1012	3A-4-1	22.5	11.4	3.4	1.12	Blade

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